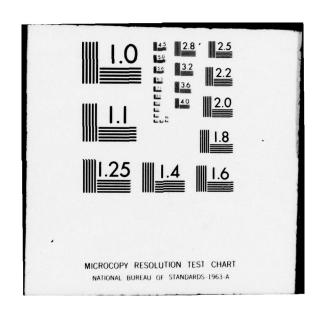
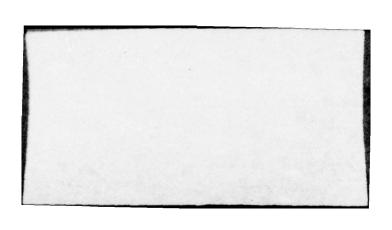
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCH--ETC F/6 5/8 AD-A066 197 A DEVELOPMENT SYSTEM FOR MICROPROCESSOR BASED PATTERN RECOGNIZE--ETC(U) DEC 78 J R LEARY AFIT/GCS/EE/78-12-VOL-2 UNCLASSIFIED NL 1 OF 2 AD A088197 المستشالة Mala da Middle L INH. J.





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A DEVELOPMENT SYSTEM FOR MICROPROCESSOR BASED PATTERN RECOGNIZERS

**THESIS** 

AFIT/GCS/EE/78-12

John R. Leary Captain, USAF

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A DEVELOPMENT SYSTEM FOR
MICROPROCESSOR BASED PATTERN RECOGNIZERS. Volume II.

HESTS

VOLUME II,

Presented to the Faculty of the School of Engineering
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in Partial Fulfillment of the
Requirements for the Degree of

Master of Science

2 Master's thesis,

by

John R./Leary A.B.

**Graduate Computer Systems** 

December 1978

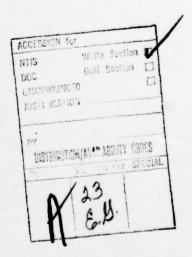
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## Preface

This volume contains documentation for the BOX80 System.

This documentation is presented in a series of appendices. Each contains a set of charts, tables, or program listings which describe the BOX 80 System.



# Volume II Table of Contents

		Page
Appendix A	Data Structure Formats	A-1
Appendix B	User Input Guide	B-1
Appendix C	Journal Output Summary	C-1
Appendix D	Module Parameters	D-1
Appendix E	CREATE Module	E-1
Appendix F	DEFINE Module	F-1
Appendix G	TRYOUT Module	G-1
Appendix H	FORMAT Module	H-1
Appendix I	TAPEIN Module	I-1
Appendix J	DECIDE Module	J-1
Appendix K	Sample Execution Output	K-1
Appendix L	Alphabet Classification Experiments	L-1
Appendix M	Support and Utility Subroutines	M-1

# List of Tables

Table		Page
	Volume II	
A-I	FEAT File Data Format	A-2
A-II	CLAS File Data Structure	A-3
A-III	CLAS File Data Item Definition	A-4
A-IV	HIST/DIST Files - Data Structure	A-6
A-V	PROT File and Record Structure	A-7
A-VI	FVEC File and Record Structure	A-8
	DEEC 0 (ODEATE)	D 0
B-I	DEFC Control Options (CREATE)	B-2
B-II	DEFD Control Options (DEFINE)	B-3
B-III	NEXCLA Control Inputs (DEFINE)	B-4
B-IV	SUBSET Control Inputs (TRYOUT)	B-6
B-V	FIGM Control Inputs (TRYOUT)	B-7
B-VI	DEFT Control Options (TRYOUT)	B-8
B-VII	DEFT Control Options (FORMAT)	B-9
B-VIII	USER Inputs to FORMAT Routines	B-10
B-IX	TAPEIN Execution Procedure	B-12
B-X	Generating a PROT File Cassette Tape	B-13
C-I	CREATE LOGF Outputs	C-2
C-11	DEFINE Terminal Output	C-3
C-III	DEFINE LOGF Output	C-4

# List of Tables (Continued)

Table		Page
	Volume II (Continued)	
C-IV	TRYOUT LOGF Output	C-5
C-V	FORMAT LOGF Output	C-6
D-I	I/O Parameters for CREATE Routines	D-2
D-II	I/O Parameters for DEFINE Routines	D-3
D-III	I/O Parameters for TRYOUT Routines	D-4
D-IV	I/O Parameters for FORMAT Routines	D-5
V-D	Utility Routine Calling Parameters	D-6
D-VI	Support Routine Calling Parameters	D-8
D-VII	SBC 80/20 Hexadecimal Data Format	D-10
D-VIII	User Input Routine Parameters	D-11

APPENDIX A

Data Structure Formats

#### TABLE A-I

#### FEAT Data File Format

#### HEADER BLOCK:

NAME, LABLE, JDX, LB, IC, MAXV, IOPT, IHIS, FIRS, FLAS

#### DATA BLOCK:

FEAT (JDX, LB)

#### TRAILER BLOCK:

FMIN (JDX), FMAX (JDX)

Definitions: (Implicit type unless indicated)

NAME - File name, 4HFEAT

LABLF - Label, nnnn user input

JDX - Number of features +3, data buffer X-dimension

LB - Number of fectors, per block

IC - Number of pattern classes

MAXV - Maximum vectors per block

IOPT - Scaling option used by CREATE

IHIS - Histogram option used by CREATE

FIRS - Minimum component value over all dimensions

FLAS - Maximum component value over all dimensions

 $\mathbf{j} \qquad -1 \leq \mathbf{j} \leq \mathsf{JD}$ 

ℓ - 1 < ℓ < LB</p>

FEAT (j, 1) - Vector component

FEAT (JD+1, £) - Integer vector number

FEAT (JD+2, £) - Integer class identifier

FEAT (JD+3,1) - Vector energy value

FMIN (j) - Minimum component for this dimension

FMAX (j) - Maximum component for this dimension

FMIN (JD+1) - 1

FMAX (JD+1) - 2

FMIN (JD+2) - 98

FMAX (JD+2) - 99

FMIN (JD+3) - 0.

FMAX (JD+3) - 0.

# TABLE A-II CLAS File Data Structure

### **HEADER RECORD:**

NAME, LABLC, JDX, ICX, NTC, NBUC, MAXKV,

... NENT, NCIX, MSCAL, MZAPD

#### DATA RECORD:

CLAS(JDX,i), 1<i<ICX

VECTOR BLOCK:

CLAS(JDX,i),  $1 \le i \le (NCIX-1)$ 

INDEX BLOCK:

CLAS(JDX,i),NCIX<i<ICX

0R

LIST (NENT,2)

### VECTOR TYPES:

MEAN: CLAS(J, NCAV), 1<j<JD

DEVIATION: CLAS(j, NCSD), 1<j<JD

DEVIATION (L): CLAS(j, NCSDL), 1<j<JD

DEVIATION (R): CLAS(j,NCSDR), 1<j<JD

HUSK: CLAS (j, NPOS), 1<j<JDX

CMIN: CLAS (j, NCMIN), 1<j<JD

CMAX: CLAS (j,NCMAX), 1<j<JD

#### TABLE A-III

# CLAS File Data Item Definitions (1/2)

# VECTOR TAGS: (Type is implicit unless stated)

- (A) i = NCAV, NCSD, NCSDL, OR NCSDR
- CLAS (JD+1, NCAV) FLAC
- CLAS (DJ+1,NCSD) FIRC
- CLAS (DJ+1,NCSDL) FIRC
- CLAS (JD+1,NCSDR) FLAC
- CLAS (D+2,i) KTYP (0, 1, or  $2 \sim NCAV, NCSDL, NCSDR$ )
- CLAS (JD+3,i) NEXC
- (B) i = NCMIN OR NCMAX (LIMITS VECTORS)
- CLAS (JD+1,i) 0.0
- CLAS (JD+2,i) -1 (NCMIN), -2 (NCMAX)
- CLAS (JD+3,i) 98 ONCMIN), 99 (NCMAX)
- (C) i = NPOS (HUSK VECTORS)
- CLAS (JD+1,i) NEXKE
- CLAS (JD+2,i) KTYP (3, 4 . . . (MAXKV+1)
- CLAS (JD+3,i) NEXC

### ITEM DEFINITIONS:

- (A) COMPONENTS, 1<j<JD
- CLAS (j,NCAV) Mean component value for the class
- CLAS (j,NCSD) Standard deviation value as above
- CLAS (j,NCSDL) Negative zero-based deviation as above
- CLAS (j,NCSDR) Positive zero-based deviation as above
- CLAS (j, NCMIN) Minimum component value overall
- CLAS (j,NCMAX) Maximum component value overall
- CLAS (j,NPOS) Vector id assigned to class husk

#### TABLE A-III

### CLAS File Data Item Definitions (2/2)

## VARIABLE DEFINITIONS: (Variable type is implicit)

IC - Number of FEAT file data classes

ICX - Number of columns in CLAS buffer

NCIX - First column of LIST area in CLAS buffer

JD - Number of feature dimensions

JDX - X-dimension of CLAS buffer = JD+3

NAME - File name, 4HCLAS

LABLC - Label nnnncc set by user

NTC - Total number of class prototypes

NBUC - Number of histogram intervals

MAXKV - Maximum value number of husk vectors

NENT - Number of entries in LIST index array

MSCAL - Flag indicates vector component value range

MZAPD - Flag indicates existence of zapped values

NCAV - Column number of a class mean vector

NCSD - Column number of a class deviation vector

NCSDL - Column number of a class negative deviation vector

NCSDR - Column number of a class positive deviation vector

NPOS - Column number of a class husk vector

NCMIN - Column number of the minimum values vector

NCMAX - Column number of the maximum values vector

KTYP - Vector type code

NEXC - Class identifier

NEXKE - Pointer to next open entry in husk vector

FIRC - Minimum value, all components, this class

FLAC - Maximum value, all components, this class

#### TABLE A-IV

#### HIST/DIST File Data Structure

#### HEADER RECORD:

NAME, LABEL, NHX, JD, IDUM(1), . . . IDUM(6)

#### DATA RECORDS:

NEXC, ISYM, KTR, NI, NBUC, . . . HISC (NHX, JD)

Definitions: (Type is implicit unless indicated)

NAME - File name, 4HHIST or 4HDIST

LABLC - nnnnmm set by user

NHX - X-dimension of data array

JD - Number of feature dimensions

IDUM(6) - Six arbitrary values

NEXC - Current class id

ISYM - Switch indicates histogram pair

KTR - First position of "right" histogram

NI - Number of intervals if histogram pair

NBUC - Number of intervals if single histogram

For the following items

K = 1 or KTR, 1 < j < JD, 1 < n < NI or NBUC

HISC(K+0,j) - Count of values processed, NUM

HISC(K+1,j) - Mean value

HISC(K+2,j) - Standard Deviation

HISC(K+3,j) - Interval Containing Mode

HISC(K+4,j) - Minimum value

HISC(K+5,j) - Maximum value

HISC(K+6,j) - Mode value

HISC(K+7,j) - Mode count as fraction of NUM

HISC(K+n,j) - Histogram interval counters

### TABLE A-V

#### PROT File and Record Structure

## FILE STRUCTURE:

 $1 \le j \le jx$ , jx = JD+1

PROT (1,1), . . . PROT (j,1), . . . PROT (jx,1)

PROT (1,IC), . . . PROT (j,IC), . . . PROT (jx,IC)

## RECORD STRUCTURE:

1<i<IC

ICLAS(i), CAV(1,i), CSOL(1,i), CSDR(1,i), . . .

. . . CAV(JD,i), CSDL(JD,i), CSDR(JD,i)

## VARIABLE DEFINITIONS:

PROT(j,i) - Class (prototype) definition

JD - Number of features

IC - Number of classes

ICLAS(i) - Identifier for I<sup>th</sup> class

CAV(j,i) - Mean for component J, Class I

CSDL(j,i) - Negative deviation for component J, Class I

CSDR(j,i) - Positive deviation for component J, Class I

## TABLE A-VI

#### FVEC File and Record Structure

#### FILE STRUCTURE:

 $1 \le k K$ , K = JD+2,  $1 \le n \le N$ 

FVEC(1,1), . . . FVEC(k,1), . . . FVEC(k,1)

FVEC(1,N), . . . FVEC(k,N), . . . FVEC(k,N)

#### RECORD STRUCTURE:

 $1 \le j \le JD$ ,  $1 \le n \le N$ 

IKNO (n), IVEC (n), FEAT (j,n), . . . FEAT (JD,n)

### VARIABLE DEFINITIONS:

j - Feature component index

n - Feature vector index

k - FVEC record item index

FVEC(k,n) - Record item

FEAT(j,n) - Feature component j of vector n

IKNO(n) - Record item indicates known class

IVEC(n) - Record item identifies feature vector

APPENDIX B

User Input Guide

TABLE B-I
DEFC Control Options (CREATE)

CREATE

**ENTER** 

\*abcd

Entries abcd may be in any order Selects feature vector transforms U feature vectors are unitized for output S a minimum and maximum component value is obtained for the entire input data set; output feature vector components are scaled to this value range E feature vectors are energy normalized for output Q minimum and maximum values are obtained for each component; output feature vector components are scaled to the associated value range N no vector transforms b Histogram control H a HIST File is output containing a distribution and statistics for each input feature vector component no HIST file output Δ User input option 0<n<9 input to user read routine n d LOGF control switch L Journal entries of user inputs, summary statistics Y Exit traces T Data buffer dump

# TABLE B-II DEFD Control Options (DEFINE)

## DEFINE

## ENTER MODE AND OPTIONS

# \*a,bcde

Entries	b-e can be in any order
a	Mode of operation
I	initialize a CLAS file
F	follow-on process of a CLAS file
b	Print file
P	Print CLAS file at end job
Δ	no action
С	Reallocate memory
E	Extend CLAS file memory allocation
Δ	no action
ď	Save option
S	Writes newly generated file over input file
Δ	Generates a new file
e	LOGF Switch
L	Journal record of file headers, control inputs and memory allocations
Y	Traces file manipulations and routine exits
Т	Records content of each FEAT record processed

# TABLE B-III NEXCLA Control Inputs (DEFINE)

NEXT-CLASS ENTER FUNCTION AND CLASS ID \*aaa,b,±cc

,	
Entri	s a,b,c are in fixed order
a	Function control
REF	generate or revise symmetric prototype
DEF	generate asymmetric prototype
Kde	kernel options (d,e,f can be in any order)
	c reset husk with program <u>calculated</u> vector ids
	p reset husk with interactively <u>picked</u> vector ids
	s update husk with manually <u>sele</u> cted vector ids
b	Histogram option control
Н	generate a HIST file record while processing this class
Δ	no action
С	Class identification
+NN	use husk list to reject vectors from prototype generati
-NN	ignore husk
00	ignore husk, initialize full CLAS file from all of FEAT file
ENTER	MAX SIZE KERNEL
XX.XX	
aa.aa	
aa.aa	Estimate of class boundary 'diameter' (Used in automatic husk selection stub)
QUICK	PLOT (Y/N)
a	
a	Class features cluster plot control
Y	Plot only component points
N	Plot connected lines

# TABLE B-III (Continued) NEXCLA Control Inputs (DEFINE)

ENTER S	CALING OPTION (U,C,M)	
*a		
a	Class features cluster plot control	
U	Scale components to max-min of data set	
С	Scale components to max-min of class	
М	Scale components with Mahalanobis' Distance	
*a,bbb,bl	NV, (15)	
a	Insert/Delete Control	
Α	Add feature ids to husk list	
D	Delete feature ids from husk list	
bbb	Feature selector id	
123	Identifiers must be in increasing order	

TABLE B-IV
SUBSET Control Inputs (TRYOUT)

Request	Entry	Description/Effect	
ENTER CLASS	00	Quit SUBSET; end TRYOUT	
+CL	88	Quit SUBSET: continue TRYOUT	
*	98	Reinitialize CLAS file	
	+99	Zap specified dimensions for all classes	
CC	1 <cc<ntc< td=""><td>(No. Prototype Classes)</td></cc<ntc<>	(No. Prototype Classes)	
		Zap Dimensions as above $(\pm)$ for specified class	
DD,DD,	NN	1 <nn<jd (no="" dimensions)<="" feature="" td=""></nn<jd>	
	99	End of input list	
	Else	Error	
		NN specifies a component or dimension of the feature/prototype space which will be nullified or zapped for either one class or all classes per CL entry	

TABLE B-V
FIGM Control Inputs (TRYOUT)

Request	Entry	Description/Effect
ENTER F/M SET NUMBER	1,2	Select F/M subspace
	0	User sets subspaces
	3	Exit tryout
SPECIFY SUBSPACE TAGS		
KK,KK,	NN	1 <nn<jd (jd="No." consider="" dimension="" dimensions)="" feature="" identifies="" next<="" td="" to=""></nn<jd>
	99	End of input list
	Else	Error
		The order in which KK are input defines the order (and so the content) of the set of nested subspaces which are evaluated. A 99 entry indicates that the remaining unspecified subspaces may have any order.

# TABLE B-VI

# DEFT Control Options (TRYOUT)

# TRYOUT ENTER OPTIONS

# \*abcdef

Ent	Entries a-f can be in any order		
a		Summary Answer	
	Α	overall error rate	
	C	confusion matrix on LOGF	
b		Scaling Options	
	N	none	
	В	scale to byte (0-255) range	
	W	scale to word (0-32767) range	
С		Figure of Merit	
	F	calculate a merit figure for each feature dimension for evaluation	
	Δ	none	
d		Magnitude	
	M	use Euclidean norm in distance measurements	
	Δ	use Sup norm in distance measurements	
е		Subset	
	S	allow user to zap dimensions of the prototype space and generate a new CLAS file for FORMAT with these zaps.	
	Δ	none	
f		Log Switch	
	L	logs certain process results on LOGF	
	Y	logs exits of critical routines and contents of certain buffers when changed	
	Т	logs results of intermediate calculations	

#### TABLE B-VII

## DEFT Control Options (FORMAT)

FORMAT ENTER FILE AND FUNCTION

\*abc

#### Enter a-c in any order File identifier FEAT file F CLAS file C H HIST file DIST file (produced by CREATE) Function identifier b strip chart output of any data S hexadecimal format output of FEAT or CLAS data X picture of a set of CLAS prototype boundaries or FEAT vectors LOG function control C journal entries of user inputs L exit traces Y T data buffer dumps

# TABLE B-VIII

# User Inputs to FORMAT Routines

ENTER PLO	OT PARAMETERS
ICPS,G	
*aaa,b	
aaaa b	Terminal data rate characters/second  Picture control 'G' → gridwork plot
	else → strips only.
NEXT-RECO	RD
NN-RECORD	ID
*aa	
aa	Record number, n
n = 0	n sequences from 1 to last n
n < n-pr	ior error
n ≥ n-pr	ior process stated record
n > last	n-available end job
ENTER XMI	T PARAMETERS
AAAA	
*aaaa	
aaaa	Address (Hex) for output data lines
PLOT FOLL	DWS
TYPE G TO	CONTINUE NOW AND LATER
*a	
a	G continues process. When cursors appear, a blank repeats plot.

## TABLE B-VIII (Continued)

## User Inputs to FORMAT Routines

```
CLASS = a, RB = b
 PICK VECTORS FROM c TO d
 K, VVV, VVV, . . . (15)
*e,fff,ggg, . . .
           Identify data class and current record block
  a,b
  c,d
           Identify first and last vectors remaining in current block
           Selection option for fectors
 e
      I
              within interval (fff,ggg)
      L
              from list fff,ggg,hhh, . . .
      C
              chosen until fff
      S
              skipped until fff
      E
              exit this class of vectors
              quit FORMAT
      Q
 (Options I, and L are not coded)
 CLASS = a
 ENTER SCALE CONTROLS
 BB.B, ZZ.Z, EL.
*aa.a,bb.b,cc.
 aa.a
           Base grid units
              number of x-y units per base grid block
      n
 bb.b
           Z-axis scale
              number of z units per z-axis step
cc.
           Viewing angle
              angle between the x-y plane and the observer's line of
      n
              sight
```

#### TABLE B-IX

#### TAPEIN Execution Procedure

(This procedure assumes an SBC 80/20 system with 16K RAM and HAZELTINE 2000 terminal with cassette recorder.)

Load TAPEIN module

Insert Bootstrap Cassette\*

Power up recorder

Engage Drive Head

Rewind Cassette

Set recorder to continuous offline page mode

Set terminal to batch mode, 110 band

Play back header file

Clear screen

Enter I3850(CR)

Play back execution file

Enter 'escape' character at lot

Shift/transmit

Execute TAPEIN Module

Ready recorder as above, using data cassette

Set recorder to continuous, online, page mode

Enter G3850(CR)

Play back data file

N.B. Bootstrap cassette can be constructed from the listing of the TAPEIN module given in Appendix I. Reference INTEL SBC 80/20 User Guide for 'I' command format details.

# $\begin{array}{c} \text{TABLE B-X} \\ \text{Generating a PROT File Cassette Tape} \end{array}$

(This procedure assumes a HAZELTINE 2000 Terminal with Cassette Recorder.)

Insert Cassette (use right-hand drive at AFIT!)
Power up recorder
Engage drive
Rewind cassette
Write cassette header file

Set recorder to continuous, offline, page mode Set terminal to batch mode Clear screen

Enter: control-shift-period, control-shift-oh
 (use no carriage return)

Set recorder to record/interlock mode

Enter: carriage return
Set recorder to reset mode

Write cassette data file

Set terminal to full duplex mode

ATTACH,BYTE (produced by FORMAT module)

COPYBF,BYTE,OUTPUT (no carriage return)

Set recorder to continuous, online page mode

Set recorder to record/interlock mode

Enter carriage return

Set recorder to reset mode (at eot)

Rewind cassette



APPENDIX C

Journal Output Summary

TABLE C-I
CREATE LOGF Outputs

Routine	LOGSW	Output and Conditions
DEFA	L,T,Y	Initialization request and response
DEFA	L,T,Y	Memory allocation record
DEFA	Υ,Τ	Exit trace
SCAN	Τ,Υ	Exit trace
SCAN	L,T,Y	First pass scan statistics
COPY	T	Dump of input data buffer
COPY	Y,T	Exit trace

# TABLE C-II

# DEFINE Terminal Outputs

Routine	Description
DEFD	Requests processing mode and options
	Identifies initial CLAS file if mode 'I' or option 'E' used
OPENX	Identifies CLAS and FEAT files opened
ALLOC	Requests approval of memory/file size parameters
NEXCL	Requests next class id and function
	Requests max size husk if 'C' function used
	Requests plot scale options if 'P' function used
	Requests husk entries if 'S' function used
PHUSK	Prints husk entries for current class if 'S' function used
FANDER	Labels class features cluster plot
	Draws cluster plot
WRCLAS	Identifies output CLAS file parameters
DEFINE	Prints end of job error messages
ERR	Prints error prompt ('?')

TABLE C-JII
DEFINE LOGF Output

Routine	LOGSW	Output and Conditions
DEFD	L	Log of Operating mode and options
OPENX	L,T,Y	FEAT file header if opened
OPENX	L,T,Y	CLAS file header if opened
DEFD	L,T,Y	Log of initial CLAS file parameters
DEFD	T,Y	Exit trace
ALLOC	L,T,Y	Record of memory allocation
ALLOC	T,Y	Exit trace
NEXCLA	L,T,Y	Record of control parameters set
PHUSK		List of Husk entries for current class if requested
KERPUT	Т,Ү	Trace of file manipulations as husk is set
CLASSX	Т, Ү	Trace of CLAS file pointers for current prototypes
CLASSX	T	List of FEAT file contents
CLASSX	T,Y	Exit trace
ADD	T,Y	Exit trace
DEL	T,Y	Exit trace
RFEAT	T,Y	Exit trace
RIX	T,Y	Exit trace
FANDER	T,Y	Exit trace
CDEFI	T,Y	Exit trace
	Y,L	Record of generated prototype
KERGET	T,Y	Exit trace
WRHIS	L,T,Y	Record of HIST file header
	L,T,Y	HIST file record id
	Y	HIST file record content
PRCLAS	L,T,Y	CLAS file dump (This dump can be forced by initial option 'P')

TABLE C-IV
TRYOUT LOGF Outputs

Routine	LOGSW	Output and Conditions
DEFI	L,T,Y	Echo of initiation requests and responses
OPENX	L,T,Y	FEAT file header, if opened
OPENX	L,T,Y	CLAS file header, if opened
DEFT	T,Y	Exit trace
INDEX	L,T,Y	Index to CLAS file
INDEX	L	CLAS file dump if scale transform
INDEX	T,Y	CLAS file dump
MERIT	Т	Distance vectors for each unque prototype pair
	L	Average interclass distances for each prototype
	T	Intermediate figures of merit for features
SUBSET	Υ	Echo of SUBSET initiation requests and responses
	L	Summary by prototype of features zapped
	Y,T	CLAS file dump
FIGM	L,Y,T	Figures of merit for feature dimensions
	Y,T	Echoes specified set of merit figures
	L,Y,T	Subspace tags list
EVAL	Т	Distance vector to selected prototype for first five vectors in each FEAT block
EVAL	Y,T	Feature vectors (first five) of each FEAT block
DOCU	L,T,Y	Summary performance percentages
DOCU		Confusion matrix if 'C' user option
DOCU	L,T,Y	Subspace tags and error rates if 'F' user option
PRCLAS	L	CLAS file dump
RFEAT	T,Y	Exit trace

TABLE C-V
FORMAT LOGF Outputs

Routine	LOGSW	Output Description
DEFA	L,Y,T	Record of FORMAT initialization
OPENH	L,T,Y	Record of HIST file initialization
OPENX	L,T,Y	Record of FEAT, and CLAS file initialization
INDEX	T	Exit trace
INDEX	L	Format printout of CLAS file if re-scaled
NEXREC	L,Y,T	Journal entry for record processed
NEXVEC	L,Y,T	Journal entry for vectors selected
FILBUF	L	Printout of statistics from HIST file record
FILBUF	Y	Printout of histograms from HIST file record
PICT	L,T,Y	Journal entry for 3-D plot parameters
RHIST	L,T,Y	Journal entry for each HIST record

APPENDIX D

Module Parameters

# TABLE D-I

#### I/O Parameters for CREATE Subroutines

DEFC(IEOJ, NW, JDK, NHX)

SCAN(BUF, HISG, VECS, IEOJ, NW, NHX)

COPY(BUF, FVEC, HISG, IEOJ, NW, JDX, NHX, VECS)

GETFEA(IUSER,BUF,NW,FVEC,JD,IC,NVEC,IGC,IEOJ)

PRHIST (HISG, NHX)

IEOJ - Error flag

NW - User buffer size

JDX - Feature vector buffer X dimension

NHX - Histogram buffer X dimension

BUF - User buffer

HISG - Histogram buffer

VECS - Temporary work area

FVEC - Feature vector

IUSER - Name of user file

JD - Number of feature vector components

IC - Number of a priori data classes

NVEC - Feature vector number

IGC - Option switch from terminal

# TABLE D-II

### I/O Parameters for DEFINE Subroutines

DEFD(IEDJ)

ALLOC(KC, NE, HUSKR, IEOJ)

NEXCLA(FEAT, CLAS, JDX, IEOJ)

CLASSX(FEAT, CLAS, HISC, JDX, NHX, IEOJ)

CDEFI(FEAT, CLAS, HISC, JDX, NHX, IEOJ)

FANDER(CLAS,JDX,FEAT,IEOJ)

PHUSK(CLAS, JDX, IEOJ)

KERPUT(CLAS, JDX, NEXC, IDOJ)

SETUM(CLAS, FEAT, JDX, IEOJ)

IEOJ - Error flag

KC - Number of a priori data classes

NE - Number of open CLAS file vectors

HUSKR - Greatest fraction of any class allowed as husk

FEAT - Feature vectors data block

CLAS - Prototype file buffer

JDX - Feature vector buffer X dimension

HISC - Histogram file buffer

NHX - Histogram buffer X dimension

NEXC - Class being processed

#### TABLE D-III

# I/O Parameters for TRYOUT Subroutines

DEFT(IEOJ)

MERIT(FT, DISI, DISN, CLAS, JDX)

SUBSET(CLAS, JDX, ICX, IEOJ)

FIGM(FT, JDX, IEOJ)

EVAL(FEAT, CLAS, CMX, JDX, NAX, IC, IEOJ)

LOOK

DOCU(CMX,CLAS,JDX,NAX,IC)

IEOJ - Error flag

FT - Work area contains feature merit figures

DISI - Work area:interprototype distance to  $\mathbf{I}^{\mathsf{th}}$  prototype

DISN - Work area: interprototype distance to N<sup>th</sup> prototype

CLAS - Prototype file buffer

JDX - X dimension for feature and prototype vector buffers

ICX - Y dimension for feature and prototype vector buffers

CMX - Confusion matrix buffer

NAX - Confusion matrix Y dimension = NTC+1

IC - Number of a priori classes

# Table D-IV

# I/O Parameters for FORMAT Subroutines

DEFF(IEOJ)

XCLAS(CLAS, BUF, HID, JDX, NBX, IEOJ)

XFEAT(FEAT, BUF, HID, CLAS, JDX, NBX, IEOJ)

XHIST(HIST, BUF, HID, NHX, NBX, IEOJ)

TIMX

PICT(BUF, HID, NX, NY)

STRIP(BUF, NX, NY)

FILBUF(HIST, BUF, NHX, JI, JN, NX, NY, ICON)

NEXREC(IEOJ)

NEXVEC(ISEQ, NVEC, NRB, IEOJ)

IEOJ - Error flag

CLAS - CLAS file buffer

BUF - PLOT buffer

HID - Hidden line buffer for PLOT3D

JDX - X dimension of CLAS, and FEAT buffers

NBX - X dimension of PLOT buffer

FEAT - FEAT file buffer

NHX - X dimension of HIST file buffer

NX - X dimension of PLOT buffer

NY - Y dimension of PLOT buffer

HIST - HIST file buffer

JI - Starting component number for buffer fill

JN - Ending component number for buffer fill

ICON - Switch indicates HIST record symmetry-type

ISEQ - Initialization switch

NVEC - Selected vector number

NRB - Feature record block number = NBPR

#### TABLE D-V

# Utility Routine Calling Parameters (1/2)

ADD(NAME,LIST,NENT,NPOS,IEOJ)
DEL(NAME,LIST,NENT,NPOS,IEOJ)
INITC(NENT,LIST,IADD)
RIX(NAME,LIST,NENT,NPOS,IEOJ)

IEOJ - Error Flag

NAME - Identifier for requested vector

LIST - CLAS file index area

NENT - Number of entries in LIST

NPOS - Pointer to requested vector

IADD - Switch allows added index initialization

STATH(LAS, FIN, FT, FHIS, NI, FIRS, FLAS) STATX(LAS, FIN, FT, CAV, CSD, ISW)

XSCAL(FMIN, FMAX, VEC, NN, SCALE, IOP)

LAS - Switch triggers final calculations

FIN - Input value

FT - List of 8 statistics (see code)

FHIS - Array of containing histogram

NI - Number of histogram intervals

FIRS - Least value in data range

FLAS - Greatest value in data range

CAV - Mean of input data stream

CSD - Standard deviation of input data

ISW - Switch selects deviation algorithm

FMIN - Vector of minimum component values

FMAX - Vector of maximum component values

VEC - Input vector

NN - Order of input vector

SCALE - Requested output value range

IOP - Switch selects scaling algorithm

#### TABLE D-V

# Utility Routine Calling Parameters (2/2)

INDEX(CLAS, JDX, ICX, IEOJ)

KERGET (CLAS, JDX, NEXC, IEOJ)

PROCLAS(CLAK, LIST, CLAS, JDR, ICX)

LOADC(CLAS, JDX, ICX, IEOJ)

OPENH(LABLH, IEOJ)

OPENX(IMOD, IE, LABLC, LABLF, IEOJ)

RHIST(HISC, NHX, IEOJ)

RFEAT(FEAT, JDX, INIT, IEOJ)

WRCLAS(CLAS, JDX, ICX, IS, LABLC)

WRHIS(HISC, HEXC, ISYM, LABLC, NBUC, KTR, NI, NHX, JDX)

CLAS - Prototype data file buffer

JDX - X dimension, number of components +3

ICX - Y dimension, number data vectors in CLAS

IEOJ - Error flag

NEXC - Data class indicator

CLAK - Prototype data file for integer reference

LIST - Prototype data file index

LABLH - HIST file label

IMOD - Mode switch, controls opening of FEAT file

IE - Extend switch, controls opening of CLAS file

LABLC - CLAS file label

LABLF - FEAT file label

HISC HIST file buffer

NHX - X dimension, number of intervals +8

FEAT - FEAT file buffer

INIT - Switch controls FEAT file positioning

IS - CLAS file header parameter

ISYM - Flag indicates histogram pair

NBUC - Number of histogram intervals

KTR - First value of second set of statistics

NI - Number of intervals if histogram pair exists

#### TABLE D-VI

# Support Routine Calling Parameters (1/2)

MARK(IX, IY, IDX, IDY)

ENER(VEC,N)

PLOT3D(FCN2D, HID, IMAX, JMAX)

PLX(X,Y,II)

ILINE

IASORT(IN, NN)

FDSORT(FIN, ITAG, FOUT, NN)

IX - X-position of mark in screen units

IY - Y-position of mark in screen units

IDX - X-movement for mark

IDY - Y-movement for mark

VEC - Array of components of vector

N - Order of vector

FCN2D - Array of surface Z values

HID - Work area

IMAX - X-dimension of FCN2D

JMAX - Y-dimension of FCN2D

X - Pen position in inches

Y - Pen position in inches

II - Control switch for pen up/down/origin

IN - Vector of integer inputs

NN - Order of input vector

FIN - Array of real input values

ITAG - Array of value "tags"

FOUT - Array of real output values

# TABLE D-VI

# Support Routine Calling Parameters (2/2)

DIV Input BC,D

Output C,B

BC - Unsigned dividend

D - Unsigned divisor

C - Quotient

B - Remainder

BNBCD Input DE, HL

Output BCD characters

DE - Unsigned integer

HL - Pointer to lowest buffer location

CLOOP Input B, HL

Output HL,B,A, character print

B - Number of characters

HL - Pointer to lowest character in string

A,B,HL - Destroyed on output

OUTB Input HL, DE, B

Output Typewriter print

HL - Address of values list

DE - Address of putput line

B - Length of output line

### TABLE D-VII

SBC 80/20 Hexadecimal Data Format

#### DATA LINE VARIABLES:

LS, LNUM, LADR, LTYPE, LBYTE(16), LSUM

#### VARIABLE DEFINITIONS:

LS - Start of line character (1H:)

LNUM - Count of the number of data bytes to follow, encoded in hexadecimal notation (A2)

LADR - Address of the storage location for the first data byte, encoded in hexadecimal notation (A4)

LTYP - Line type (00-data line; 01-end record line)

LBYTE - A set of up to 16 data values, each represented as a hexadecimal number (A2)

LSUM - A checksum, in hexadecimal of the sum 255 -  $\sum_{i=1}^{I} K_i \text{ where one } K_i \text{ represents each 2-character hexadecimal value following the start of line character (1H:)}$ 

#### TABLE D-VIII

# User Input Subroutine Parameters

# GETFEA(IUSER,BUF,NW,FVEC,JD,IC,NVEC,IGC,IEOJ)

IUSER - Name of user input file

BUF - Address of input buffer

NW - Number of words allotted input buffer

FVEC - Feature vector passed to system from module

JD - Number of feature dimensions

IC - Number of pattern classes

NVEC - Identifier for FVEC within its class

IGC - Input control switch

IEOJ - Control flag

APPENDIX E

CREATE Module

```
IF (ISCAN.EQ. 1.0R. 10PT.NE. 2.0R. 10PT.NE. 3) COTO 9
              ISCAN-->CALC (FIRS,FLAS) FOR SHIFT(S),AND TRANSFORM(T) OPTIONS, AND FOR FEAT FILE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         F((10PT+15CAN).NE.8.AND.IHIS.NE.2) COTO 16
                                                         FCRMAT (7H CREATE/14H ENTER OPTIONS/2H +)
                                                                                                                                                                                                                                                                                                                                                                                                                        IF (10PT.EQ.1.0R.10PT.EQ.4) ISCAN=1
                                                                                                                                                                                                                 IF (KOPS(K), EQ. IHU) 10PT=2
IF (KOPS(K), EQ. IHE) 10PT=2
                                                                                                                                                                                        1021=5
                                                                                                                                                                                                   1091=1
                                                                                                                                                                                                                                                                                                                                                                              IF (KOPS (K). EQ. IHH) IHIS=1
IF (KOPS (K). EQ. IHN) IHIS=0
                                                                                                                                                                                                                                               IF (KIOPS (K) .EG. IHI) IGC=1
                                                                                                                                                                                                                                                             IF (KOPS (K) . EQ. 1H2) 1CC=2
IF (KOPS (K) . EQ. 1H3) 1CC=3
                                                                                                                                                                                                                                                                                          IF (KOPS (K) .EQ. 1H4) ICC=4
                                                                                                                                                                                                                                                                                                         IF (KOPS (K) .EQ. 1H5) 100=5
                                                                                                                                                                                                                                                                                                                      IF (KOPS (K) .EQ. 196) ICC=6
                                                                                                                                                                                                                                                                                                                                    IF (KOPS (K) .EQ. 1H7) 10C=7
                                                                                                                                                                                                                                                                                                                                                   IF (KOPS (K) . EQ. 1H8) 100=8
                                                                                                                                                                                                                                                                                                                                                                IF (KOPS (K) .EQ. 1H9) ICC=9
                                                                                                                                                                                                                                                                                                                                                                                                                                       FUHIS.EG. 1) ISCAN=1
                                                                                                                                            IF (KOPS (K), EQ. IHL) I
IF (KOPS (K), EQ. IHY) I
IF (KOPS (K), EQ. IHQ) I
                                                                                                                                                                                       IF (KOPS (K) . EQ. IHI)
                                                                                                                                                                                                   IF (KOPS (K) . EQ. IHS)
                                                                          READ (INPF, 901) KOPS
                                                                                                                                 IF (KOPS (K) . EQ. IHT)
                                          WRITE(IOUTF, 908)
                                                                                                    FORMAT (2X, 4A1)
                                                                                      FORMAT (4A1)
                                                                                                                DO 8 K=1.4
                                                                                                                                                                                                                                                                                                                                                                                                                                                     TRS=+1E8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    T.AS=-1E8
                                                                                                                                                                                                                                                                                                                                                                                                          CONTINUE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                :IRS=-1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               LAS=+1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CONTINUE
                                                         918:-
655=C
618=C
628=C
636=
                                                                                                       COMMON/MANES/INPF. IDUTF. IFERT. IUSER. IDUM, ILOGF. IDIST
                                                                            I LABLE, JD, LE, IC, MAIV, NBUC, NIC, MEM, FIRS, FLAS, IU
                                                             COMMON/CREA/IOPT, INIS, ISCAN, NH1, NF1, NL1, IGC,
                    SUBROUTINE DEFA(IEOJ.NW.JDX.NHX)
CORMON/TRACE/ILOG.ITRACE
                                                                                                                                                                  INITIALIZE PARAMETERS
                                                                                           DIMENSION KOPS(4)
                                                                                                                                                                                                                                                                     TRACE=6LOUTPUT
                                                                                                                                                                                                                                                       OUTF=6LOUTPUT
                                                                                                                                                                                 TUSER =4LUSER
                                                                                                                                                                                                                         ILOGF=4LLOGF
INPF=5LINPUT
                                                                                                                                                                                             IFEAT=4LFEAT
                                                                                                                                                                                                             IDIST=4LDIST
```

CALL ERR (TOUTF, NN, TEOJ)

IF (IEOJ.CT.8) RETURN COTO 5

ISCAN=6

#=007J 141S=2

```
IF (ILOG-NE-8)

1. WRITE (ILOG-N-98-7-X0PS-LABLE-NW-JD-1C-NBUC-NEC-MAXV
                                                                                                                                                                                                                                                                               NRITE (TOUTF.984) NOF SLABLE, NAIJ JULIONBOUCHECHMAN
FORMATIZSH AFROVE ADJUSTED FARANETERS/,
I SIH OFTS LABLE, NDITE JULIONI, NET MYV/,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   FORMATCISH FEAT FILE HAS , 15, 18H WORDS AND, 15,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  IF (ILOG.NE. B) WRITE (ILOGF, 986) MEMF, LB, MEMH: NBUC
RESET NBUC SINCE NOT ENOUGH ROOM LEFT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       2 16H DIST FILE HAS , IS.18H WORDS AND, IS. 28H STEPS FER HISTOCRAM)
                                                                                    RESET NEC SINCE NOT ENDUCH ROOM
                                                                                                                                                                                                                                                                                                                                    2 1X14A112X114,1X114,4(1X,12),1X113/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     WRITE (10UTF, 986) NEMF, LB, MEMH, NEUC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ECHO SPACE ALLOCATIONS
                                                                                                                                                                                                                             FRINT ADJUSTED PARAMETERS
                                                                                                     IF ( (LB-18) . GE. NEC) 60T0 29
                                                                                                                                                                                                                                                                                                                                                    3 14H ENTER Y OR N/2H +)
READ(INFF,995) IOK
                                                                                                                                                                                                                                                                                                                                                                                                                            SET CONTROLS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1 18H VECTORS PER DLOCK/
                                                                                                                                                                                           IF (LE. GT. MAXV) LB=KAXV
                                                                                                                                                                                                                                                                                                                                                                                                       IF (IOK. NE. IHY) COTO 18
                                                     SCAN=10PT+IHIS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             METH = NHY+JD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NET - NET - NEW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NL 1=NF 1+KEKF
                                                                                                                                                                                                                                                                                                                                                                                                                                                            MENF = JOX+LB
                                                                                                                                                                                                                                                                                                                                                                                         FORMAT (A1)
                                                                                                                                                                                                                                                                                                                                                                                                                                           NTC=1C+NEC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NHX = 8+NEUC
                                                                                                                         NEC-18-16
                                                                                                                                                                             LB=LB-NEC
                                                                                                                                                                                                              CONTINUE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NH1=1HN
                                                                     6070 26
                                                                                                                                                          COTO 35
                 1H15=0
                                   NBUC-8
                                                                                                                                           LB=16
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1748= 986
                                                                                                                                                                                                                                                                                                1268= 984
                                                                                                                                                                                                                                                                                                                                                                                       1618= 985
                                                                                                                                                                         1498= 29
                 409= 25
                                                                                                                                                                                                             1518= 38
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1786=044
                                                                                                      456= 27
                                                                                      3=8++1
                                                                                                                                                                                                                             3:875
                                                                                                                                                                                                                                                                                                                                                                                                                        J=8591
                                                                                                                                        486=
                                                                                                                                                                                            -00GS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1716=C
1726=
1736=
                                                                                                                         1450=
                                                                                                                                                                                                                                                                1546=
                                                                                                                                                                                                                                                                                                                  1576=
                                                                                                                                                                                                                                                1538=
                                                                                                                                                                                                                                                                                                                                                                      1683=
                                                                                                                                                                                                                                                                                                                                                                                                        1628=
                                                                                                                                                                                                                                                                                                                                                                                                                                                        1658=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1666=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1693=
                                                                                                                                                                                                                                                                                                                                                                                                                                           1648=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1686=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1766=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             *MTOT1=REM(WORK-(SCR(ZBB)-BUF(NW)-DIST(8,JB)-CSAVE) >
                                                                                                                                                                                                              IF (JD. GE. 1. AND. NBUC. GE. B. AND. NW. GT. JD.
1 AND. NEC. GE. B. AND. IC. GE. 1. AND. IC. LE. 361 GOTO 16.
                                                                                                                                                                                                                                                                                                                                                                                                                                                           *NV SPLITS INTO HISTO INTERVALS (NEUC, MIN=18)
                                                                                                                                                                            READIINFF, 983) LABLF.NN. JD. IC. NBUC. NEC. MAXV FORMAT (14.1X.14.4 (1X.12).1X.13)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            *AND TO FVEC BLOCK SIZE (LB.MIN-18)
                                                                                                                                                          1 27H LABLINBUF, JD, IC.NI, NE, MXV/2H #)
                                                                                                                                                                                                                                                                                                                                                                                                        IF (INW-MEMC).LT.0) MEMCS=IAES(NW-MEMC)
MIDIL=NEM-200-NW-(8+JD)-MEMCS
                                                                     IF (ILDC.NE.8) WRITE (ILOGF, 988)
IF (ILOC.NE.8) WRITE (ILOGF, 911) KOPS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 *REDUCE LB, THEN NBUC, THEN NEC
                                                                                                                                        FORMAT 117H ENTER PARAMETERS!
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       FORMAT (15% NEW TOO SMALL)
                                   GET PARAMETERS
                                                                                                                                                                                                                                                                                 CALL ERR(IOUTF,NN,IEOJ)
IF(IEOJ,GT.8) RETURN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                IF INBUC. GE. 181 GOTO 27
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  IF (INV.LT.NEC) 60T0 38
IF (IHIS.EQ.1) 60T0 25
                                                                                                                                                                                                                                                                                                                                     SET CONTROLS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      IF (LE.LT.18) 60TO 38
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 IF (LB. GT. 19) GOTO 27
                                                                                                                                                                                                                                                ERROR INPUT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        WRITE (10UTF, 987)
                                                                                                                           WRITE (TOUTF, 922)
                                                                                                                                                                                                                                                                                                                                                                        KENC=2+1C+JDX
                                                                                                                                                                                                                                                                                                                                                                                                                                            NV=KTOT1/JBX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                LB=KW-NBUC
                                                                                                                                                                                                                                                                                                                    CONTINUE
                                                                                                                                                                                                                                                                                                                                                         JDX=JD+3
                                                                                                                                                                                                                                                                  IE03=-2
                                                                                                                                                                                                                                                                                                                                                                                           MENCS=0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          6070 14
                                                                                                                                           1858= 982
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1378= 987
                                                                                                                                                                                               1118= 983
                                                                                                                                                                            1188= 15
                                                                                                                                                                                                                                                                                                                    1186= 16
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1360= 28
                                                      338= 18
                                                                                                                                                                                                                                                                  1159: 14
                                                                                                                                                                                                                                                1140=C
                                                                                                                                                                                                                                                                                                                                     3-2611
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1278=C
1280=C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1298-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                            1268=0
                                                                                                                                                                                                              1128=
                                                                                                                                                                                                                                                                                 =8911
                                                                                                                                                                                                                                                                                                                                                                        1216:
                                                                                                                                                                                                                                1138=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1316=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1328=
```

1 MRITE (ITARCE, 957) NTC, MEMF, NHX, MEMF, NHI, NFI, NLI, LB,

IF (ILOG.NE. B. AND. ILOG. LE. 2)

1796=

TRACE DEFA

NEC, ISCAN, IOPT, INIS, NEUC, NV, JDX

FORMAT (8H DEFAX , 2815)

1828= 957

RETURN

1 18H COMPONENT, 2X3HNUM, 8X2HAV, 6X4HCSDL, 2X4HCSDR, 7X3HMIN, DD 33 J=1.JD IF(ILGG.NE.B)NRITE(ILGGE,982)J+(DIST(N.J)+N=1.8) FORMRI(34H FIRST PASS SCAN STATISTICS ,LIM= ,2(IXE9.3)/ FIRS,FLAS ARE USED TO SET HISTO RANGE AND TO SHIFT FUEC COMPONENTS POSITIVE FOR CONVENIENT FIRST OCTANT PLOTS AND EASY SCALING 1 WRITE(ITRACE:957) NW, NHX, JD, MAXV, J4, J5, FIRS, FLAS IF(ILOG.NE.#)WRITE(ILOGE,9#1)FIRS,FLAS IF(DIST(5,J),LT.FIRS) FIRS=DIST(5,J)
IF(DIST(6,J),CT.FLAS) FLAS=DIST(6,J) 2 TX3HMAX,6X4HMODE,5X5HVMODE) LOG STATS FROM SCAN FORMATISH SCANX ,615,2E9.3) FORMAT (1X12, 2H= ,8(1XE9.3) ) IF (ILOC. NE. B. AND. ILOG. LE. 2) IF (LB. GT. MAXV) LB=KAXV TRACE SCAN DO 38 J=1,JD CONTINUE 3658= 33 3618- 957 3698= 982 3628=C++ 3578= 36 3588=0++ 3596= 3678= 3568= 3638= 3698= 3648= CALL CETFEA (TUSER, BUF, NW, VECS (1), JD, IC, NVEC, ICC, IEDJ) CORMON/MAMES/INPF.IDUTF.IFEAT.IUSER.IDUM.ILOGF.IDIST CORMON/CREA/IOPT.IHIS.ISCAN.NHI.NFI.NLI.IGC. VECS HOLDS FVEC, THEN CAV, THEN CSD. TEMPORARILY CALL STATI(\$,VECS(J),DIST(1,J),VECS(J4),VECS(J5),\$) LABLE, JD. LB. IC. MAXV. NBUC. NTC. MEM. FIRS. FLAS. TU CALL STATI(1, Ø. Ø. DIST(1, J), VECS(J4), VECS(J5), Ø) CALCS NUM.AV.SD.MIN.MAX; SETS FIRS.FLAS SUBROUTINE SCAN(BUF, DIST, VECS, IEDJ, NW, NHX) AND GENERATE CLOBAL MIN. MAX VALUES NUM. AV. SD. MBUC. MIN. MAX. MODE. VMOD DIMENSION BUF (NW), DIST (NHX, 1), VECS (1) ASSEMBLE STATS INTO DIST 4 5 6 IF (NVEC. GT. MAXV) MAXV=NVEC IF (IEOJ. EQ. 1) LAS=1 COMMON/TRACE/ILOG, ITRACE IF (LAS.NE.1) GOTO 18 IF (IEDJ.LT.1) GOTO 5 DO 18 J=1, JD CONTINUE CONTINUE CONTINUE JZ=24JD 7+17=17 J5=J2+J IEOJ-8 LAS=8 JEIL-1 DEIN 33338= 33438= 33548= 33548= 33548= 3418= 3 3488= 28 3196= 3018= 3448=0 3468=0 -#C#8

SINCE FI,FN ARE COMPONENT DEPENDENT THIS TRANSFORM SHIFTS RELATIVE ANCILES, KEEPS RELATIVE MACSIOPT-40 INDIVIDUALLY AS A LINEAR SHIFT OF ITS HISTOGRAM USE GLOBAL FIRS-FLAS FOR COMPARABLE DISTRIBUTIONS MORMALIZE AS OFTED AND SAVE VECTOR MAC HISTOGRAM MAY PRECEDE OR FOLLOW VECTOR TRANSFORMS CALL STATH(@.FVEC(J,L),DIST(1,J),DIST(9,J),NBUC,FIRS,FLAS) FVEC (J.L) = FVEC (J.L) - DIST (5, J) / (DIST (6, J) - DIST (5, J) + 1E-7) CALL CETFEA(IUSER. BUF, NW. FVEC(1, L), JB, KC, NVEC, ICC, IEDJ) CALL STATI(#.FVEC(J.L).DIST(1.J).VECS(J4).VECS(J5).#) COMPUTE MIN, MAX STATS ON ALL DUTPUT VECTORS SINCE EACH (T) AFFECTS EACH FVEC COMPONENT CALL STATH(1, 8.8, DIST(1, J), DIST(9, J), NEUC, FIRS, FLAS) SINCE FIRS, FLAS ARE CLOBAL, THIS SHIFTING MAINTAINS RELATIVE ANCLES AND MACS(097=5) (FIRS, FLAS) WILL BECONE (8.,1.8) LATER (FIRS, FLAS) WILL BECOME (8.,1.8) LATER IF(LAS.NE.1) GOTO 118 CALL STATX(1,0.0,0)DIST(1,J),VECS(J4),VECS(J5),0) LAST VECTOR OF RECORD FVEC(JD+3,L)=ENER(FVEC(1,L),JD) IF (10PT.EQ. 2.0R.10PT.EQ.3) CLOBAL HISTOGRAM 1 FVEC (J.L) =FVEC (J.L) /T IF (10PT.EQ.3) T=SQRT(T) IF (IOPT.NE.4) COTO 9 IF (IHIS.NE.1) GOTO 7 FITEGULNE, ØY GOTO 18 IF (IE0J.EQ.1) LAS=1 FVEC (JD+1,L) =AVEC FVEC (JD+2,L)=AIC T=FVEC(JD+3,L) UC 118 J=1,JD CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE J5=J2+J JFIL=1 14:11+3 LASV=L 2766= 118 2425=C## 2436=C 15550=044 257#= 13 258#= 15 2598=044 2398=044 2488=C++ 2418=C++ 2489=C## 2668=C## 2386=C## 2518= 8 \$ =8752 2278= 5 2460=C 2658= 7 2478=C 3=8852 254Ø=C 2490= =8877 2328z 2338= 2356= 2378= 2440= 2458= 2560= 25 BE 2346= -0397 2618= 2628= 59 t @= WRITE(IFEAT) NAME, LABLF, JDX, LB, IC, MAXV, IOPT, IHIS, FIRS, FLAS COMMON/NAMES/INPF.IOUTF.IFEAT.IUSER.IDUM.ILOGF.IDIST SUBROUTINE COPY (BUF, FVEC, DIST, IEDJ, NW, JDX, NHX, VECS) COMMON/CREA/IOPT.IHIS.ISCAN.NHI.NFI.NLI.IGC. LABLF.JD.LB.IC.MAXV.NBUC.NTC.MEM.FIRS.FLAS.IU DIMENSION BUF (NW) , FVEC (JDX,1) , DIST (NHX,1) , VECS (1) REINITIALIZE DIST FOR STATY F(10PT.EQ.2.0R.10PT.EQ.3)FTRS=1.8 F(10PT.EQ.1.0R.10PT.EQ.4)FTRS=6.8 DATA NI.NZ.11,12,FB/1,2.98,99,8.1 EQUIVALENCE (AVEC, NVEC), (AIC, KC) INITIALIZE VARIABLES WRITE HEADER RECORD COMMON/TRACE/11.00, ITRACE F (10PT.NE.5) FLAS=1.0 DATA FMK/. 999E99/ DATA NANE/4HFEAT/

IF (L. LE, LB) 60TO 5

258=C\*\*\*\*\*\*\*\*\* LOOP TO COPY FILE CLASS BY CLASS

=8177 =8277 =5173 =5177

KEHIND IFEAT

B=SXTEN ASV=6 AS=B מריור

2176=

Ŧ,

DIST (1,1) = 8. OU 1 J=1, JD

2888=C++ 2168= 1 2-8112 -868Z

-8+67 -8287 -6997 =8187 12=2#JD

2148= 2168=

2128=

FVEC BLOCK IS FULL OR CLASS IS DONE
FVEC(JD+1,L)-->NVEC(I), FVEC(JD+3,L)-->ENER(F)
FVEC(JD+2,L) -->IC(I), FVEC(JD+2,LASV)<--NECATIVE
FVEC(I-->JD,L) --> VECTOR COMPONENTS(F) IF(ILOG.NE.8.AND.ILOG.EB.1)
1 WRITE(ILOGF.999)NBLKS,LASV,((FVEC(J.L),J=1,JDX),FMK,
2 L=1,LASV,LS) FORMAT(15H BUFFER TRACE ,216/(((10(1XE9.3) )))) HRITE(ITRACE,957)L, LI, LB, LS, LRSV, IEDJ, NVEC FORMAT(SH COPYX, 1818) IF(IEDJ.NE.Ø)FVEC(JD+2,LASV)=-FVEC(JD+2,LASV) IF(L1,C1,LB)COTO 40 WRITE (IFEAT) ((FVEC(K,M),K=1,JDI),M=1,LB) URITE TRAILER RECORD(MINS.MAXS) PROCESS FEATURE VECTOR BLOCK FUTS AV AND SD INTO DIST WRITE(IFEAT) ( DIST(5,J),J=1,JD),N1,11,FB, Z (DIST(6,J),J=1,JD),NZ,IZ,FØ IF (ILUG.NE. B. AND. ILOG, LE. 2) IF (IE0J.NE.1) GOTO 5 DIST(2,J)=VECS(J4) DIST(3,J)=VECS(J5) CONTINUE IF (LS, LE, #) LS=1 00 30 L=L1,LB 00 25 J=1,JDX NBLKS=NBLKS+1 Du 59 J=1, JD FVEC (J, L) = # LI=LASV+1 LS=LASV-1 CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE J5=J2+J 14=11+7 RETURN 2758=0111111 2748=C+++++ 2778=C+++++ 2788=044444 2928= 25 2938= 38 2948= 48 2958= 2958= 2948= 1978= 1988= 957 2858= 999 2798= 18 3848=C++ 3858= 56 22 = 8682 3153= 59 3820= 20 ##J=868E -8862 2998= 3838= 3188= 2818= 2868= =8882 3818= 3868= =988E 3138=

READ (1USER, 900)KC(IA), NS, NUM, (BUF(J), J=J1, JN) FORMAT (IX, I1, I2, ZX, I3, 14F5, 3) REPD(IUSER,988)KC(IA),NS.NUM. (BUF(U),J=J1,JN) IF(KC(IA),EQ.KC(IB)) ODTO 38 PROCESS ON FOLLOW ON ENTRIES DIMENSION BUF (1) . FVEC (1) . KC (2) INITIALIZE ON FIRST ENTRY IF(IFIRS.EQ.1) GOTO 10 F(IEDJ.NE.8) NVEC-8 IF (EDF (IUSER) ) 28,16 END OF FILE DO 15 J=1,JD FVEC(J)=BUF(J1) J1=(IA-1)+JD+1 JI=(IA-1)+JD+1 J1=[1B-1)+JD+1 REWIND TUSER NVEC=NVEC+1 1-01+10=15 1-05+17-85 IC=KC(IB) FIRS=1 CONTINUE 1+10=10 CONTINUE CONTINUE NVEC = 0 60TO 38 TEOJ=B FIRS=8 (E03=-1 IE03=1 IK=IA IA=IB IB=IK A: 4426= 968 4558= 4558= 4578= 4588= 4598= 4598= 4458= 18 1338=6++ \*\*J=8>>) 4428=C++ \$668= 28 -665+ 4410= =6894 =8955 -6/16-\$496= 4496= 4589= 4510= 4526= 4530= =8695 4618= 4628= 4638= =8194 =819 468Ø= THIS SUBMODULE READS FEATURE VECTORS FROM A DATA THIS OF RADAR SIGNATURE PATTERNS. THE FEATURES WERE COMPUTED BY MAJOR DEL KULCHAK IN THE COURSE OF HIS THESIS WORK ON A FATTERN RECOGNITION PROBLEM. THIS SUBMODULE MEETS SPECIFICATIONS FOR USER INPUT TO THE "CREATE" MODULE OF SUBROUTINE GETFER (TUSER, BUF, NW, FVEC, JD, IC, NVEC, ICC, IEOJ) 4779=C\*\*\* RETURNS FVEC.1C.NVEC.1EDJ ON EACH EKTRY 4128=C\*\* SETS 1C AND NVEC SO AS TO ALMAYS REFLECT 4198=C\*\* SETS 1C AND NVEC SO AS TO ALMAYS REFLECT 4228=C\*\*\* SETS 1EDJ--> @ IF NVEC IS FIRST TO (LAST-1)TH OF CLASS 4218=C\*\*\* SETS 1EDJ--> -1 IF NVEC IS LAST OF FILE 4228=C\*\*\* SETS 1EDJ--> +1 IF NVEC IS LAST OF FILE 4238=C\*\*\* RESETS INTERNAL FLAGS AT LAST OF FILE NW -->NO NORDS IN BUFFER FVEC -->FEATURE VECTOR PASSED TO STSTEM FROM MODULE --- SEUFFER REQUIRED FOR WORK SPACE BY MODULE JD -->NO OF COMPONENTS OF FEATURE VECTOR

1C -->CLASS TO WHICH FVEC A PRIORI BELONGS
NVPC -->NUMBER OF FVEC WITHIN CLASS USER INPUT MODULE SPECIFICATIONS IGC --->INPUT OPTION
IEOJ --->CONTROL FLAC (SEE BELOW) IUSER--- NAME OF USER INPUT FILE REWINDS TUSER ON FIRS ENTRY THE 'BOX88' SYSTEM. 1848=C++++++ \*\*\*\*\*\*\*\*\*3=0\*11 318=0+++++ 1248=C+++++ 1169=(1++ #3=8581 #3-9/8t +3=868t 1188=C+ 1128=C# 4138=C+ #3=898h #3=#8#t 1118=C+ 1158-C 1258=C 3=897 4278=C J=837 3-6621

EXIT

CONTINUE

4766= 38

##3=869

RETURN

4718=

THIS SURMODULE READS FEATURE VECTORS FROM A DATA BASE OF RADAR SIGNATURE PATTERNS. THE FEATURES WERE COMPUTED BY MAJOR CLAY STEWART IN THE COURSE OF HIS DISSERTATION ON A PATTERN RECOGNITION ALGORITHM. THIS SUBMODULE MEETS SPECIFICATIONS FOR USER INPUT TO THE "CREATE" MODULE OF THE "BOIGS" SYSTEM. SUBROUTINE CLAFEA(IUSER, BUF, NW. FVEC, JD, IC, NVEC, IGC, IEOJ) DATA NCLAS(1), NCLAS(2), NCLAS(3), NCLAS(4), DATA NOLAS(1), NCLAS(2), NCLAS(3), NCLAS(4) DIMENSION NCLAS(7), BUF (NW), FVEC(1) PROCESS FOLLOW ON ENTRIES INITIALIZE ON FIRST ENTRY IF(IFIRS.EQ.1) GOTO 5 READ(IUSER, 900) (FVEC(J), J=1, JD) IF INVEC. LT. NCLAS (KC) ) GOTO 38 INCLAS(5), NCLAS(6), NCLAS(7) 2 /751,349,471,83,18,45,8/ IF (NCLAS (KC) . GT. 8) GOTO 38 IF(IEDJ.NE.Ø) IC=KC-1 RETURN END IF (IEOJ, NE. B) NVEC = 8 END OF FILE IF (EOF (IUSER)) 28,6 1 1628,296,471,81 FORMAT (F16.5) EXIT REWIND TUSER NVEC=NVEC+1 CONTINUE CONTINUE IFIRS=1 CONTINUE IFIRS=6 1E0J=-1 NVEC = 8 1E0.J=8 KC=KC+1 IE0.3=1 JK=JI KC=1 ######J=Ø28# 1768=C+++++ 5048= 6 5918= 988 5898= 28 5138= 38 449=8=64 5118= 5128=C++ 5688=C++ 4978= 5 4859=C# 113-8861 4866=C# 4876=C# 3=884 4798=C 3=8984 4819=0 3=878+ =868 5828= 1848= =6334 4910= 4938= 4956= =836 -8665 -2395 5656= 5666= 5198= 5148= 5168= 5176= 5188= =0165

5689-C++ END OF FILE 5678- 28 CONTINUE 578- 1E0.3-1 5718- 1F1RS-1 5728-C++ EXIT 5738- 38 CONTINUE 5738- 38 CONTINUE 5748- 1C-KC 5758- 1F(1E0.4.K-0) 1C-KC-1 5758- RETURN 5778- END	578#= SUBROUTINE REDUCE (IMP,NI,101,NO) 588#=	125 125 116
SUBROUTINE SPOFEA(IUSER, BUF, NW, FVEC, JD, IC, NVEC, IGC, IEQJ) ****  ***  ***  ***  ***  ***  ***	DIMENSION BUFINN, FVECIOD)  INITIALIZE ON FIRST ENTRY  OPEN FILE ONCE DALY FER JOS  IOC CONTROLS LIN(FECTORS READ), AND NDIMINPUT DIN)  1, 2, 3, 4, 5,  788,1858,3988, 788,1858,(LIM)  9, 25, 49, 9, 25,(NDIM)  ISH=(IGC-1)/3 + 1  IF(ISN-EQ-1)/LIM=788  IF(	IT TELED-ME-BY WECK-BY  CALL READMS (TUSER, BUF, 85, NIN)  NIN-NIN-2& CALL REDUCE (BUF, 81, RUF, NDIN)  DO 6 J=1, JD  FVEC(J) = BUF (J)  NVEC-NVEC+1  IF (NIN-LE-LIM) COTO 7  LIM-2&69>199 ALPHABETS, ETC  KC-KC+1  NIN-KC  IE OJ1  CDNINNE  IF (KC, LT, 27) COTO 38
5196= 5216= 5216= 5216= 5236= 5246= 5258= 5258= 5276=	50.00 = 0	55.58= 55.58= 55.58= 55.58= 55.58= 56.58= 56.58= 56.58= 56.58= 56.58= 56.58= 56.58= 56.58= 56.58=

APPENDIX F
DEFINE Module

IF (IMOD. EQ. IHI) CALL SETLIM (WG (NC1) , WG (NF1) , JDX) FORMAT(2X,38H NO MORE ROOM FOR NEW CLASSES) FORMAT(2X,28H NO MAX,MIN VECTORS) CALL PRCLAS(WO(NCI),WO(NCI),WO(NCI),JDX) FORMAT (ZX, 27H NO SUCH CLASS OF FEATURES) FORMAT(29H CLAS AND FEAT FILE DISACREE) CALL WRCLAS (WO (NC1), JDX, ICX, IS, LABLC) ERROR EXIT PRINTS ERROR KEY FORMAT (2x, 19H NOT ENGUGH MEMORY) FORMAT(1X, 18H TOO MANY RETRIES ) IF(IEDJ.EQ.1) WRITE(IOUTF,908) IF(IEOJ.ED.3) WRITE(IOUTF,981)
IF(IEOJ.ED.3) WRITE(IOUTF,982) IF(IEOJ.EQ.4) WRITE(IOUTF,983) IF(IEOJ.EQ.5) WRITE(IOUTF,984) IF (IEOJ.EQ.6) WRITE (IOUTF,985) END OF JOB OPTIONS FORMAT (ZX.12H ERROR EXIT) IF (IPK.E9.1.0R.1L0C.CT.8) IF (IEDJ.CT.8) COTO 188 WRITE (1007F, 999) 1288= 856 CONTINUE CONTINUE STOP 55265-5586-5586-5526-1938= 168 483E9=0## 1188=C++ 5888= COMMON/NAMES/INPF, 100TF, IFEAT, 10LDC, INEWC, 1LOCF, IHISC IF(INOD.EQ.INF) CALL LOADC(WO(NCI),JDI,ICX)
LOOP PICKS CLASSES FOR DEFINITION
IF(IALL.NE.I) CALL NEXCLA(WO(NFI),WO(NCI),JDX,IEOJ)
IF(IEOJ.CI.8) GOTO 188 COMMON/PARAM/MEMC. MEM. NHX, JDX, ICX, NC1, NF1, NH1, IC COMMON/CONTRL/ IMOD, IALL, ISTM, ICAL, IPIC, IH, IS, I IUKER, LABLC, LABLF, SIZE, IFK PROCRAM DEFINE (FEAT, OLDC, NEUC, HISC, LOCF = 64, CALL CLASSX (WO (NF1), WO (NC1), WO (NH1), JULY 26 1978 JRL IF (IALL.EG.1) NEXC=NEXC+1
IF (NEXC.CT.IC) COTO 808 INPUT=64,0UTPUT=64) COMMON/TRACE/ILOG, ITRACE FORMAT (9H DEFD-E , 1815) IF (IEOJ, CT. 8) GOTO 189 IF (IE0J.CT.8) COTO 198 IF (ICON. EQ. 8) COTO 19 DATA INF. INI / INF. INI / COMMON/CNUM/NEXC, NTC ICON-ISYM+ICAL+IPIC I JDX,NHX, IEOJ) CALL DEFD(IEDJ) CONKON NO (7588) NEN=7508 DO 5 N=1,NEN 40 (M) =8. 1538=C+++++++ 1966=0++++++ 2488= 2588=C\*\* 2788= 18 2300= 957 1388= 5 1668= 1388= 1488= 1783= 3588= 3688= 3288= 3488=

	IF (IOPNS (J), EQ, IMP) IFK=1 IF (IOPNS (J), EQ, IMP) IS=1 IF (IOPNS (J), EQ, IMP) IS=1 IF (IOPNS (J), EQ, IMP) ILOG=2 IF (IOPNS (J), EQ, IMP) ILOG=2 IF (IOPNS (J), EQ, IMP) ILOG=2 CONTINUE IF (IRL, NE, P) COTO 15 CALL ERR(IOUTF, NN, IEOJ) IF (IEOJ, CT, Ø) COTO 16 COTO 7 OPEN FILES CONTINUE IF (ILOG, NE, MANNETE (II ODE, 941)		41300-C** OBTAIN INITIAL PARAMS FOR NEW OR REVISED CLAS FILE 41480-C************************************
137488- 5 13758- 981 13758- 7 13758- 7 13758- 7 13858- 982 13858- 982 13858- 13858-	128569= 128669= 138669= 138669= 138669= 138669= 138669= 138669= 13866= 1	139388	141488=0+++ 141488=0+++ 141488=0+++ 141488=098 141988=998 141988=998
SUBROUTINE DEFD(150J) COMMON/CNUM/NEXC.NTC COMMON/CNUM/NEXC.NTC COMMON/CNTR/1MOD.1ALL.1SYM.1CAL.1PIC.1H.1S. 1 IUNER.LBLC.LABLE.51Ze.1PK COMMON/CLUS/1CFS.1DUIK.1SCF COMMON/TRACE/1LOG.1TRACE COMMON/TRACE/1LOG.1TRACE	-	THE HEHRENZ	0FN-F>
	**************************************	1055-028 = 1	137888=C++ 137888=C++ 137888=C++ 137388=C++

IF (ILGG.NE. #.AND.ILGC.LE.2)
WRITE(ITRACE.957) HUSKR.NF1.NC1.NH1.NCIX.NENT.ICX.MEMC. IF(ILOG.NE.0)NRITE(ILOGF,905) LABLC IF(ILOG.NE.0)NRITE(ILOGF,907)NEUC,NE.HUSKR IF(IMOD\_NE\_IHI) GOTO 118
ALLOCATE MEM TO INITIAL FILE
ADJUST NE,NEUC,MAKKV TO SET MEMC
CONTINUE IF (NEUC. LT. 8.0R. HBUC. CT. 50) COTO 48
IF (NE. LT. 8.0R. HUSKR. LT. 8.) COTO 48 CALL ALLOC (NTC, NE, HUSKR, IEDJ) CALL ALLOCITC, NE, HUSKR, IEOJ)
IF(IEOJ, GT, Ø) COTO 168
IF(NBUC, GT, Ø) IH=1 REALLOCATE MEMORY TO OLDC REVISE CLAS FILE POINTERS I IE.NBUC.MAXV.NTC.IC.JDX.NE FORMAT(SH DEFD ,F6.4,2015) RETURN SETUP BUFFER POINTERS CALL ERRITOUTF,NN, IEDJ)
IF (IEDJ, CT. 8) COTO 168 IF (IE0J.CT.8) COTO 168 IF (IE0J.E0.5) 60T0 78 CHECK PARAMETERS NC1=NF1+JDX+LB NH1=NC1+MEMC ICX=MEMC/JDX NHX=NBUC+8 NTC=1C COTO 148 CONTINUE CONTINUE 60TO 58 66 0103 CONTINUE CONTINUE ISYM=1 1E0J=0 EXIT NF1=1 143688= 168 144208= 144308= 144408=C++ 144509= 110 146988= 957 147888= 147188= 45666= 148 143386= 143489=C\*\* 143586=C\*\* 46488= 168 42588=C++ 44950=C++ 46360=C++ 85 =865.75 43288= 50 145186= 142688= -868241 143666= 43168= 143886= 143986= 144688= 145988= 146999= 146183= 146588= =66771 -823911 -851991 -638551

```
1 28H NB.NE. MAXRV. CLAS FILE SIZE/2X, 12, 1X, 12, 1X, 15, 9X, 16/)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            WRITE (ITRACE, 957) HUSKR, KNB, KNE, KXV, MENT, MENX, MEMH, MENC,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      FORMAT (28H APPROVE ADJUSTED PARAMETERS/
                                                                                                                                                                                                                                                                                                                                                                                                                                                     INRITE (ILOGF, 988) NBUC, NE, MAXKE, MEMC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            2 MAXV, MAXKV, KC, NE, NEUC, LB, JD, IEOJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   WRITE(IQUTF, 988) NBUC, NE, MAXKE, MENC
                                                                                                                                                                                                                                                                                                                             MENC=KENC+MENX+KIX (MENC, MENX, JDX)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      918 FORMAT (14H ENTER Y OR M/ZH 4)
                                                                                                                                                                                                                                                                                                                                                                                                     NENT = ( (NTCOL +2+4) / JDX+1) + JDX/2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              APPROVE ADJUSTED PARAMETERS
                                                                                                          IF ((JD*MAIKV).LE.8) GOTO 138
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       IF (ILOG.NE. 8. AND. ILOG.LE, 2)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             FORMATION ALLOC (E9.3,1715)
                                                                                                                                                                                                                                                                                                                                                                                                                                       IF (ILOG.NE.B. AND. ILOG.LE.3)
                                                                                                                                                                                                                                                                                         IF CHKV. NE. MAXKV) GOTO 159
                                                                                                                                               HENC=JDX #KMC (KC, Ø, MAXKV)
                                                                                                                                                                                                                                                      IF IKNE, NE, NBUC) COTO 158
                   IF (NBUC, LE. 8) SOTO 128
                                                                                                                                                                                                                                                                       IF IKNE.NE.NE) COTO 158
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              IF (10K.EQ. INY) GOTO 145
                                                                                                                                                                                                                                                                                                                                                                                  NTCOL = KMC (NC, NE, MAXKV)
                                                                                                                                                                                                                                                                                                                                                                SET NENT AND NCII
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           READ (INPF, 989) 10K
                                                                                                                                                                                                                                                                                                                                                MAXKE=KAXKV+JD
                                                                                                                              MAXKV-MAXKV-1
                                                     MENH=JD+NBUC
                                                                                                                                                                                                                                                                                                                                                                                                                    NCIX=NTCOL+1
                                     NBUC-NBUC-S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             FORMAT (A1)
                                                                                                                                                              COTO 195
                                                                       COTO 185
                                                                                                                                                                                   CONTINUE
                                                                                                                                                                                                                      3070 145
                                                                                                                                                                                                                                                                                                             CONTINUE
                                                                                           CONTINUE
                                                                                                                                                                                                                                        CONTINUE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CONTINUE
                                                                                                                                                                                                    1E0J=3
                                                                                                                                                                                                                                                                                         131186=
131280= 145
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            131966= 957
                                                                                                                                                                                                                                      138888= 148
138988=
29500= 116
                                                                                         36866= 128
                                                                                                                                                                                30500= 130
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 37268= 158
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    32488= 988
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           32988= 989
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            132886=
132188=C##
                                                                                                                                                                                                                                                                                                                                               131488=
131418=C++
                                                                                                                                                                                                                                                                                                                           131366=
                                                                                                                                             38360=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      32588=
                                                     29888=
                                                                                                                                                                                                                      38788=
                                                                                                                                                                                                                                                                       131888=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   32368=
                                                                       29988=
                                                                                                            36166=
                                                                                                                           30200=
                                                                                                                                                                 -835861
                                                                                                                                                                                                    -9999601
                                                                                                                                                                                                                                                                                                                                                                                  13142@=
                                                                                                                                                                                                                                                                                                                                                                                                 31436=
                                                                                                                                                                                                                                                                                                                                                                                                                    131446=
                                                                                                                                                                                                                                                                                                                                                                                                                                                     31580=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         131686=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          32660=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        132700=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             133888=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                33708=
                                                                                                                                                                                                                                                                                                                                               KME-- SANDUNT OF UNUSED MEMORY, GIVEN EXISTING REQUESTS
                                                                       COMMON/MAMES/INPF, IOUTF, IFEAT, IOLDC, INEWC, ILOGF, IHISC
                                                                                                             COMMON/PARAM/MEMC.MEM.NHX.JDX.ICX.NCI.NFI.NH1.IC
                                                                                                                                                                                                  USES MEN. JD. KC. MAXV. HUSKR., TO SET MAXKV. MENC
                                                                                                                                                                                                                   AFTER ADJUSTING NE, NBUC, MAXKY USING STAT FNS
KMC-->NO VECTORS FOR CAV, CSDL, CSDR, HUSKY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         IF (KME (MENT, MENY, MENH, MENC, JDX), CT. 8) COTO 148
                                                                                                                           COMMON/WFILE/MAXWV.NCIX.NENT.MSCAL,MZAPD
COMMON/DIST/FIRS.FLAS.FIRC.FLAC.NDUC.KTR.NI
                                                                                                                                                                                                                                                                                         KIX--)NO ENTRIES IN LIST.IX FOR CLAS FILE
                                                                                                                                                                                                                                                                                                                              112*(NEMC/JDX)+2*(MEMX/JDX)+4)/JDX+1)+JDX
                                                                                                                                                                                                                                                                                                                                                                                  I MENT-MEMC-MENH-MENX-KIX (MENX, MENC, JDX)
                                                                                                                                                               CONNON/CREC/LASV, IEDFR, NBPR, LB, MAXV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ADD 1 TO NE FOR MIN/MAX VECTORS
                                                        SUPROUTINE ALLOC (KC. NE. HUSKR, JEDJ)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               IF (MAXKV. GT. B) MAXKV=MAXKV/JD+1
                                                                                                                                                                                                                                                                                                                                                                 KME (MENT, MENX, MENN, MENC, JDX) =
                                                                                                                                                                                                                                                                                                                                                                                                   END OF STATEMENT FUNCTIONS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MENY = JOX + KMC (Ø - NE - MAXKV)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       MERC=JDX+KMC (KC.B.MAXKV)
                                                                                                                                                                                                                                                                                                                                                                                                                                      NBUC= ((((NBUC-1)/5)+1)+5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   HENX=JOX+KMC (Ø.NE, MAXKV)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MAXKV=FLOAT (MAXV) *HUSKR
                                                                                                                                                                                                                                                                                                             KIX (MEMC, MEMX, JDX) =
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   MENT - MEM - JOX + L.B - 84 JD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              IF (NE.LE.1) COTO 118
                                                                                                                                                                                                                                                                           (MAXKU+3) + (KC+NE)
                                                                                                                                                                                                                                                         KMC (KC, NE, MAXKV) =
                                                                                                                                                                                   DATA INY/IHY/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        FENH - JD4NDUC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    KKV=MAXKV
                                                                                                                                                                                                                                                                                                                                                                                                                        S-X00-00
                                                                                                                                                                                                                                                                                                                                                                                                                                                           KNB=NBUC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CONTINUE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NE=NE+1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               KNE-NE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        281 -98682
                                                                                                                                                                                                                                                                                        27299=C++
27388=
                                                                                                                                                                                                 26588=044
                                                                                                                                                                                                                      26688=C+s
                                                                                                                                                                                                                                       27898=C##
                                                                                                                                                                                                                                                                                                                                               27498=C++
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ##J=#1387
                                                                                                                                                                                                                                                                                                                                                                                                     77788=C+4
                                                                                                                                                                                                                                                                                                                                                                              27688=
                                                                                                                                                                                                                                                        27106=
                                                                                                                                                                                                                                                                           27288=
                                                                                                                                                                                                                                                                                                                           -83117
                                                                                                                                                                                                                                                                                                                                                                  27568=
                                                                                                                                                                                                                                                                                                                                                                                                                    7866=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 28568=
                                                                        25880=
                                                                                                            26666=
                                                                                                                            126180=
                                                                                                                                                               -8359Z
                                                                                                                                                                                                                                                                                                                                                                                                                                         27988=
                                                                                                                                                                                                                                                                                                                                                                                                                                                           28888=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            -87837
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               =888837
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   28688=
                                                                                                                                                                                   26488=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               28188=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                28208=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     28766=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            29888=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               29208=
```

33466=

200	11488= IF(ITYP(1).EQ.HG) GOTO 228 11388= IF(ITYP(1).EQ.HR) ISTX=1	11798= IF(ICLX,LT.0) IUNER=1			12200= 1F(1)F(1).EQ.1HK.OK.11F(1).EQ.1HD.OR. 12360= 1 ITF(1).EQ.1HK) GOTO 18	9	12585= IF(IEOJ.CT.8) COTO 222	12078-CFF NAERNU ENINIES FUN CHVICSULICSUNINGSKY	#	THIS PERM	18 CON	IF.		13488= CALL REEAT(FEAT, JDX:INIT:IEOJ)	15395 BALTER ALALES	15 CON		=	14.56= NEXC=1CLI	145962-C++ IT(15)7-NE,87 GUIG 222	DO 18 J=2,4		IF (ITYP (J), EQ. IHP)	IF (ITYP (J) .EQ.	3715	15588	15588= 982 FORMATIC 26H ENTER MAY SIZE KERNET 17H XX XX/2H 4	28 CONTINUE	15588= READ(INFF,983) SIZE	_	16288= 6010 28	
788G= SUBROUTINE NEXCLA (FEAT, CLAS, JDX, 1EOJ)		-	٠.	7688= COMMON/HAMES/INPF, IOUTF, IFEAT, IOLDC, INENC, ILOGF, IHISC	7888=C** SUBMODULE SETS NEXC AND CONTROLS 7988=C**	SEGRECE & CONTROL OPTIONS FOR NEXCLAS		HE NE	OMEGA-CHA DEFINE PROCESS CAN GENERALE ASSIMETRIC CLASSES		103		8926=0** H> HISTOGRAM THIS CLAS AND SAVE IT	^X-	9289=Ca+ 66> DO FULL FILE INTIPALIZE FRUCESS	Acceptate Distriction Front Link 19 (17 AS(LINK 1) . 11479(S)		I IND. INV. IN		2		18286= 1SA=1HD			S(1)=0	INCOME. TATA CONTACTOR CONTROLS TOR MEAN CLASS		996	11888= 1 12H AARA+H++NN/2H +)			

CET FUNCTIONS, VALIDATE AND RETRY

0

```
WRITE(ILOGF, 916) ICLX, IH, IUKER, ICAL, IPIC, ISET, ICPS, IQUIK,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    2 2X:15:1X:14:1X:15:1X:17:1X:16:1X:14:1X:16:1X:15:1X:F5.2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   FORKATIZBH NEXT-CLASS OPTIONS/ 7H CLASS, 1 49H.HIST.SHUCK.CLUSTER.S-HUSK.BHUD.Q-PLOT.SCALE.SIZE/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   WRITE(ITRACE, 959) ISTM, IEDJ, NN, ICLX, LASTI, LASTN
ENSURE SUCCESSIVE MEXC'S ASCEND
                                                                                                                                                                       INSERT ILIS INTO HUSK PER ISA
                                                              53
                                                                                                                                                                                                                                                                                                                                                                                                              KERPUT OUT OF SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          QUIT EXIT FINISHES JOB
                                                                                                                                                                                                                    FORMAT(18H KERP-IN ,A1,1X,2814)
                                                                                                                                                                                                                                   CALL KERPUT (CLAS, JDX, NEXC, TEDJ)
                                                           IF (ILIS (1), GE, ILIS (1+1)) 60T0
                                                                                                                                                                                                    1 WRITE(ITRACE, 958) ISA, KK, ILIS
                                                                                                                                                                                                                                                                                IF(IEGJ.E.S) 6010 222
IF(IEGJ.E9.2)4RITE(160TF,914)
IF(IEGJ.E9.4)4RITE(160TF,915)
                                                                                                                                                                                    IF (ILOG, NE. B. AND, ILOG, LE. 2)
                                                                                                                                                                                                                                                                                                                                                 FORMATCIAH CLAS FILE FULL)
FORMATCIAH HUSK IS FULL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  IF (TLOG.NE. 9. AND. TLOG.LE. 2)
                                             IF (ILIS(I+1).EQ.Ø) COTO 89
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                FORMAT(11H NEXCLA-I +1815)
RETURN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       IF (ILDG.NE. B. AND. ILOG.LE.3)
                                                                                           CALL ERRITOUTF, NN. IEGJ)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NORMAL EXIT
                                                                                                                       IF (IEOJ. GT. 8) COTO 222
                                                                                                                                                                                                                                                                                                                               IF (IE0J.EQ.6) 60T0 99
              DO 60 I=1,14
                                                                                                                                                                                                                                                   DO 85 1=1,15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1SCF, SIZE
                                                                                                                                                                                                                                                                   ILIS(I)=@
                                                                             CONTINUE
                                                                                                                                        COTO 55
                                                                                                                                                          CONTINUE
                                                                                                                                                                                                                                                                                                                                                                                                COTO 222
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CONTINUE
                                                                                                                                                                                                                                                                                                                                                                                                                             CONTINUE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NEXC=999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CONTINUE
                                                                                                                                                                                                                                                                                                                                                                                                                                             E07=-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                           COTO 65
                                                                                                                                                                                                                                                                                                                                                                                IEOJ=8
                                                                                                                                                                                                                                                                                                                               22588= 914
22588= 914
22588= 915
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     23719= 1
23726= 2
23736= 916
23749= 1
23756= 2
23856= 1
                                                                                                                                                                                                                    21760= 958
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      23766= 222
23765=
                                                                                                                                                     21380= 86
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                14000= 959
                                                                         89 = 80887
                                                                                                           21060= 65
                                                                                                                                                                                                                                                                                                                                                                                                                                                         23208=
23368=C++
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         3486= 226
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         23588=0##
                                                                                                                                                                       11100=C#
                                                                                                                                                                                                                                                                   22666= 85
                                                                                                                                                                                                                                                                                                                                                                                                                             36 -9935
                                                                                                                                                                                                                                                                                                                                                                                                             22988=C++
                                                                                           269835
                                            20608=
                                                                                                                         1100=
                                                                                                                                       -99717
                                                                                                                                                                                       21588=
                                                                                                                                                                                                                                                   21900=
                                                                                                                                                                                                                                                                                                                                                                              22788=
                              -69292
                                                           -99197
                                                                                                                                                                                                                                       -00817
                                                                                                                                                                                                                                                                                22166=
22266=
22366=
                                                                                                                                                                                                                                                                                                                                                                                                                                          23189=
                                                                   FORMATISSH ENTER BAUD, AND GUICK PLOTIY,N)/7H CPS.4/2H +)
                                                                                                                                                                                                                                                                                                                                                                                                                                                       FORMAT(19H SET HUSK VECTOR/19H A, NV, NV, ...(15)/2H +)
                                                                                                                                                                  FORMATICAN ENTER SCALING OPTION (U.C.K) /2H *)
READ(INPF.987) ITYP(1)
                                                                                                                                  SET SCALING OPTIONS FOR FANDER
                                                                                                                                                                                                                                               U-->FIRS., C-->FIRC., M-->MAHDIS
IF(ITYP(1).EQ.IHU) ISCF=0
                                                                                                                                                                                                                                 M--->MEANS
                                                                                                                                                                                                                                                                                                                                                                                         SET HUSK VECTOR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              IF (ISA.NE. IHB. AND. ISA.NE. IHD.
                                                                                                                                                                                                                               U-->CLOBAL, C-->CLASS,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              I AND. ISA.NE. IHA), COTO 65
                                                                                                                                                                                                                                                                              FUTTPULLEG. THC) ISCF=1
                                                                                                                                                                                                                                                                                               IF (ITYP(1), EQ. IHK) ISCF=2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    READ (INPF,913) ISA,1LIS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CALL PHUSK (CLAS, JDX, IEOJ)
                                                                                                                                                                                                                                                                                                                           CALL ERR(TOUTF,NN, IEGJ)
IF(IEQJ,CT.#) COTO 222
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     IF (15A.NE. 1HP) GOTO 46
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PRINT HUSK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 IF (1E0J. CT. 8) COTO 222
                                                                                                                                                                                                                                                                                                            IF (15CF.NE.9) 60T0 35
                                                                                                                                                                                                                                                                                                                                                                                                                       IF (1SET.NE.1) 60T0 222
                                        FUPIC.NE.11 GOTO 35
                                                                                      READ (INPF, 985) ICPS, IQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SET HUSK
                                                                                                                    IF (10.EQ. IHY) 10UIK=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     FORMAT (A1, 15(1X, 13))
                                                         WAITE (TOUTF, 984)
                                                                                                                                                  WRITE(10UTF,986)
                                                                                                                                                                                                                                                                                                                                                                                                                                        WRITE (100TF, 912)
                                                                                                                                                                                                  FORMAT (A1)
                                                                                                      FORMAT (A1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CONTINUE
                                                                                                                                                                                                                                                                                                                                                          6010 34
                                                                                                                                                                                                                                                                                                                                                                           CONTINUE
                                                                                                                                                                                                                                                                                                                                                                                                         CONTINUE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  COTO 45
                                                                                                                                                                                                                  15CF=9
                                                                                                                                                                                                                                                                                                                                                                                                                                                       18988= 912
                                                                                                                                                                                                                              17608=C++
17768=C++
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      19188= 913
                                                                        $50 -609°
                                                                                                       586 -0089
                                                                                                                                                                     7288= 986
                                                                                                                                                                                 17308= 34
                                                                                                                                                                                                  17488: 987
                                                                                                                                                                                                                                                                                                                                                                        18589= 35
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    19388=C##
                                                                                                                                      7696=0+4
                                                                                                                                                                                                                                                                                                                                                                                                         8788= 45
                          57 =0869
                                                                                                                                                                                                                                                                                                                                                                                        ##3=86931
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  19888= 46
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   9738=C++
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 =9996
                                                                                      -83191
                                                                                                                     -8889 P
                                                                                                                                                   17108=
                                                                                                                                                                                                                  17588=
                                                                                                                                                                                                                                                                                              =9898
                                                                                                                                                                                                                                                                                                            18160=
                                                                                                                                                                                                                                                                                                                            18288=
                                                                                                                                                                                                                                                                                                                                                           18483=
                                                                                                                                                                                                                                                                                                                                                                                                                          18756=
                                                                                                                                                                                                                                                                                                                                                                                                                                       =899881
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      19288=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -03+6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     9508=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -99661
                                                                                                                                                                                                                                                                17888=
                                                                                                                                                                                                                                                                              17988=
                                                                                                                                                                                                                                                                                                                                            18388=
```

1 WRITE (ITRACE, 957) KERP, KIX, KK; NEXKE, NAME, NEXC, NPOS, LNAME I WRITE (ITRACE, 957) KERP, KIX, KK, NEXKE, NAME, NEXC, NPOS DELETE ALL HUSK VECTORS BEFORE INSERT CALL ADDINAME, CLAS(1, NCIX), NENT, NPOS, 1EQJ) CALL DEL (NAME, CLAS (1, WCIX), NENT, NPOS, IEDJ) CREATE ANOTHER HUSK VECTOR A MIN OF 1 IS ALWAYS DKIMASKV-B) SET NEXKE ,NEXC, AND KTYP IN CLAS IF(KTYP.GT.LIM) GOTO 40 IF(NEXC.EQ.LCLAS) NAME-NAME+1 FORMAT(2X,12,8H KERP ,1817) TOO MANY HUSK VECTORS IF (ILOC.NE.S.AND. ILOC.LE.2) IF (ILDG.NE. 8. AND. ILDG. LE. 2) IF (ILUG.NE. 8. AND. ILUG.LE. 2) IF (NAME. ED. LNAME) GOTO 28 ENTRIES OUT OF ORDER CLAS (JD+2, NFOS) =KTYP+1 IF (IEOJ. CT. E) GOTO 6\$ IF (IE0J.CT.8) COTO 26 CLAS (JD+3,NPDS) = NEXC KTYP=CLAS(JD+2,NPDS) LNAME=NEXC+1000+300 CLAS(JD+1,NP0S)=1 END OF CALL CLAS (3, NPOS) = 6 DO 58 J=1, JDX LIM=MAYKV+3 NAME = NAME - 1 LCLAS=NEXC SS400= 30 CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE COTO 28 60 0100 KERP=38 COTO 68 6010 55 KERP=55 1E03=6 1503:4 37960=C444+5 35288=C++++; 35360-C++++; 17188=C+++++; 89468=044444; 87568=C++ 87666= 45 729 = 9538 33555 SB 88268= 55 89 -8856 ##J=88999 7280= 43 86166= 58 #85288 #83288 37429= =83778 86500= =£0898 7350= =## 188 88788= 88868= 88968= =009958 8619B= =69798 =86698 878@B= =66688 88566= 89298= =96298 37698= -800668 39308= =00968 1 WRITE(ITRACE,957)KERP,KIX,KK,NEXKE,NAME,NEXC,NPOS IF(ISA,EQ,IHD) GOTO 58 1 MRITE (ITRACE, 957) KERP, KIY, KK, MEXKE, NAME, NEXC, NPOS IF (KIX, CE, KK) COTO 66 CALL RIX (NAME, CLAS (1, NCIX), NENT, NPOS, IEDJ) INSERTS ILIS VECTOR NUMBERS INTO KERVEC COMMON/KFILE/ MAXKV.NCIX.NENT.MSCAL.MZAPD IF (IL IS (1) . LE. CLAS (LASTN, NPOS) ) GOTO 45 ENSURE ASCENDING ORDER OF ENTRIES SUBROUTINE KERPUT (CLAS, JDX.NEXC, IEDJ) COMMON/KVEC/KK, ILIS(15), ISA SETUP AT NEWS FIND LAST KERVES CLAS(JD+1,NPGS) = CLAS(JD+1,NPGS)+1 GGTG 28 INSERT INTO EXISTING KERVEC BUMP NEXKE AND INSERT NVEC IF (ILIS (KIX+1), LE. 8) COTO 68 DATA LCLAS,KIX,IHD/8,8,1HD/ TF (TLOG. NE. 8. AND. TLOG. LE. 2) IF (ILOC.NE.S. AND. ILOC.LE.2) CLAS (NEXKE, NPOS) = IL IS (KIX) INSERT KVECS FROM ILIS IF (NEXC. EG. LCLAS) GOTO 18 COMMON/TRACE/ILOG, ITRACE LASTN=CLAS(JD+1,NFOS)-1 IF (NEXKE. CT. JD) COTO 38 IF (LASTN.LT.1) 60T0 20 IF (15A.NE. 1HD) GOTO 35 IF (IEDJ.EQ. 8) COTO 18 NEXKE-CLAS (JD+1, NPOS) IF (KK.E9.5) GOTO 68 INTEGER CLASIUDX+1) NAME=NEXC+1000+301 KIX=KIX+1 JD=JDX-3 CONTINUE CONTINUE COTO 35 8=F03I KERP=18 KERP=28 KTYP=2 82988=C+++ 82888=C+++ 11658=C++ 83488=C++ 83888=C++ 83988= 28 84886=C++ 8238B= -83888 83260= 83366= 8358B= \$1700= 82188= 82460= =83228 82668= 83188= =839988 84123= 84268= 266998 81428= -86318 8190B= 83788= -800058 84368= 8458B= =86958 -69718

I WRITE (ITRACE, 957) KERP, NEXC, LCLAS, NAME, NEMT, NPOS,

KIX, NEXKE, KTYP

-99268

CALL RIX (NAML, CLAS(1, NCIX), NENT, NCSDL, IEDJ) CALL RIX (WARR, CLAS (1, NCIX), NENT, NCSDR, IEDJ) CALL ADD (NAML, CLAS (1, NCIX), NENT, NCSDL, IEDJ) CALL ADD (NAMC, CLAS (1, NCIX), NENT, NCAV, 1EDJ) CALL DEL (NAMA, CLAS (1, NCIX), NENT, NPOS, IEDJ) IF(ISYM.EQ.1) COTO 164
IF(ISYM.EQ.1) COTO 165
IF(ISYM.EQ.6) COTO 187 SETUP CAV IF (IEOJ. 61.0) 6070 366 IF (TEDJ.6T.8) COTO 112 SETUP CSDL IF (IEOJ.CT. Ø) COTO 300 IF (IEOJ.CT.@) GOTO 189 NO CSDR EXPECTED IF (15YM. GT. 1) GOTO 113 SETUP FOR FANDER CLAS (JD+3,WCSDL) =FEXC FIRC = CLAS (JD+1,NCSDL) FLAC=CLAS (JD+1,NCSDR) CLAS (JD+2,NCAV) = ZER CLAS (JD+2+NCSDL) = GNE CLAS (JD+3, NCAV) =FEXC NONE EXPECTED EXPECTED CSUR FOUND NO CSDR FOUND CSDR XQC+1=C 981 00 CLAS (JANPOS) = 6 CET NUSDR CET NOSIL CONTINUE 5070 102 5010 183 CONTINUE CONTINUE COTO 16 6070 16 6070 16 COTO 18 SYM=-2 32666= 32166= 32268=6\*\* 32366= 163 32988=0\*\* 33166= 33266=C++ 33366= 165 33688= 186 33788= 33388=0+ 111 =00800 31360= 165 31886= 112 14360= 189 31166= 31267=C++ 31686= 31788=C\*\* 38688= 38788=C\*\* 4200-044 34766=0\*\* 75566=C## 34268=0## 31400= 31986= 32400= 12680= 32886= 33460= =6669±0 34460= 34600= =00698 31966= 34180= COMMON/NAMES/INPF, IGUTF, IFEAT, IGLDC, INEWC, ILOGF, IHISC DATA IZER, IONE, ITWO/6,1,2/, FMARK, IHI/. 999E99, 1HI/ SUBROUTINE CLASSX (FEAT, CLAS, HISC, JDX, NHX, IEDJ) COMMON/CONTRL/ IMOD, JALL, ISYM, ICAL, IPIC, IH, IS, DIMENSION FEAT (UDX,1),CLAS(UTX,1),HISC(NHX,1) EQUIVALENCE (IZER,ZER), (IONE,ONE), (ITMO,TWO) EQUIVALENCE (FEXC,NEXC) FEEDS FEAT RECORD PAGES TO OPTED FUNCTIONS INITIALIZE FOR COMPUTATIONS THIS CLASS CALL RIX (99888, CLAS (1, NCIX), NENT, NCMAX, IEDJ) INITIALIZE LIST.IX ON FIRST ENTRY IF(IMOD.EQ.IHI.AND.ICO.NE.I) CALL RIX (98ggg, CLAS (1, NCIX), NENT, NCMIN, IEDJ) COMMON/DIST/FIRS, FLAS, FIRC, FLAC, MEUC, KTR, WI COMMON/NFILE/MAXNV, NCIX, NENT, MSCAL, MZAPD COMMON/CLID/NCAV, NCSDL, NCSDR, NCMAX, NCMIN SET UP POINTERS TO PROTOTYPES COMMON/CREC/ LASV, IEOFR, NBPR, LB, MAXV IF(ICO.E9.1.08.1MOD.E9.1HI) COTO 218 CALL INITC(NENT, CLAS(1,NCIX), 0) I UKER, LABLC, LABLF, SIZE, IPK COMMON/TRACE/ILOG, ITRACE BEGIN NORMAL PROCESS IF (IE0J. GT. 8) GOTO 205 IF (IEOJ. CT. Ø) COTO 205 NO MIN MAX VECTORS COMMON/CNUM/NEXC, NTC IAMC=NEXC+1888+188 NAMR-NEXC+1000+202 IAML =NEXC+1660+281 CONTINUE CONTINUE COTO 218 COTO 498 JD=JDX-3 IEOJ=6 B=LINI 9224= 285 29888=C## 29188= 29236=044 9232= 218 19222-C++ 8766=C++ ##J=@986 ##J=88957 13214= :9226 -88482 =83587 28688= 28788= 28389= =89687 :9212 =91767 19218= :9228= 9468= 29568= 27588= 27788= 27588= 27988= 28188= 28188= 29288= =Ø1262 -6776 -8986

CALL RIX(NAMC, CLAS(I,NCIX), NENT, NCAV, IEDJ) IF(IEDJ.GT.B) GOTO 111

GET NCAV

36360= 161

FLAC=CLAS(JD+1,NCAV)

38588=

CALL ADD (NAMR, CLAS (1, NCIX), NENT, NCSDR, IEDJ)

34896= 113

34988=

F(IE0J.CT.8) COTO 308

CLAS (JD+3,NCSDR) = FEXC

CONTINUE

35266= 116

CLAS(JD+2,NCSDR)=TWD

SETUP NCSDR

```
CALL WRHIS (HISC, NEXC, ISYM, LABLC, WBUC, KTR, NI, NHX, JDX)
NUM.CAV.CSOL.CSDR(MBUC) MIN.MAX.MODE, WHODE (FLR.FLH), (FRL.FRH) BOUND LEFT/RIGHT DISTRIBS
                                                                                                                                                                                                                                                                              SAVE CLASS-LOCAL MIN, MAX IN CAV, CSD(L AND R)
                                                                                                                                                                                  IF (HISC (UR-1, J), LT, FRL) FRL=HISC (UR-1, J)
                                                                                                                          IF (HISC (5,J), LT, FLL) FLL=HISC (5,J)
IF (ISYM, NE.Z), COTO 38
IF (HISC (JR,J), CT, FR1) FR=HISC (JR,J)
                                                                                                                                                                                                                                                                                                                                                                                                                                              CHECK THAT RL<--->LH HERE
                                                                                                              IF (HISC (6, J), GT. FLH) FLH=HISC (6, J)
                                                                                                                                                                                                      HISC (JR-2, J) = CLAS (J, NCSDR)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               IF (ILOG.NE. 8. AND. ILOG.LE. 2)
                                                                                                                                                                                                                       HISC (JR-3, J) = CLAS (J, NCSDL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NO MORE ROOM ERROR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NORMAL EXIT
                                                                                          HISC (4,J)=CLAS (J,NCSDR)
                                                                                                                                                                                                                                        HISC (JR-4,J) = CLAS (J, NCAV)
                                                                        HISC (3, J) = CLAS (J, NCSDL)
                                                       HISC (2, J) = CLAS (J, NCAV)
                                                                                                                                                                                                                                                                                                                                                                      IF(157M.LE.1) 6070 33
                                                                                                                                                                                                                                                                                                                                                                                          CLAS (JD+1, NCSDR) = FRH
                                                                                                                                                                                                                                                                                                                                    CLAS (JD+1,NCSDL) =FLL
                                                                                                                                                                                                                                                                                             CLAS (JD+1, NCAV) =FLH
                                      DO 38 J=1,JD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 IF (IH. EQ. 1)
                                                                                                                                                                                                                                                               CONTINUE
                                                                                                                                                                                                                                                                                                                   FLAC=FLH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       COTO 468
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CONTINUE
                                                                                                                                                                                                                                                                                                                                                                                                           FLAC-FRH
                                                                                                                                                                                                                                                                                                                                                       INC=FLL
                                                                                                                                                                                                                                                                                                                                                                                                                             CONTINUE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CONTINUE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1E0J=5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         12168= 388
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               12480= 486
                                                                                                                                                                                                                                                           48658= 38
                                                                                                                                                                                                                                                                                                                                                                                                                           41488= 33
41588=0**
                                                                                                                                                                                                                                                                                                                                                                                                                                                               11690=0**
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         12000=C++
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2366=C**
                                                                                                           39566=
39566=
39566=
46668=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   -09/11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   -99811
                                                                        39266=
                                                                                                                                                                                  48188=
48288=
48388=
48488=
                                                                                                                                                                                                                                                                                               48788=
                                                                                                                                                                                                                                                                                                                                   41888=
41188=
41288=
41388=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       41966=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2206=
                                                                                                                                                                                                                                                                                               FORMAT(1X,6H CLAS ,14,18H FEAT BLK ,14,15/(((18(1XE9.3)))))
                                                                                                                                                                                                                                                                                                                                                                                                                           COMPLETE PROCESSING THIS CLASS
IF (IPIC.NE.8.AND.IALL.NE.1) CALL PICKER(FEAT.CLAS.JDX.1EDJ)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               FIRC, FLAC ARE CLASS "OVERALL" MIN, MAX VALS FIND FIRC, FLAC, IN HISC AND SAVE IN CLAS
                                                                                                                                                                                                                                                                                                                                                                     IF (ICAL, NE. 4) CALL SHUCK (FEAT, CLAS, JDX, IECJ)
IF (ISYM, GT. 3) CALL CLEFI (FEAT, CLAS, HISC, JDX, NHX, IECJ)
                                                      WRITE (ITRACE, 957) NAMC, NAML, NAMR, NCAV, NCSDL, NCSDR
                                                                                                                                                                                                                                                                                                                                                                                                                                                               INSERT CAVICSDLICSDR INTO HISC 2,3,4
                                                                                                                                                                                                                                                          IF (ILOG.EG.1) WRITE (ILOGF: 978) NEXC, NBPR, LASV,
                                                                                                                                                                                                                                                                            I (FMARK, (FEAT (M.N), M=1, JD), N=1, LASV)
                                                                                                                                                                                                                                                                                                                                                  1 CALL FANDER(CLAS, JDX, FEAT, IEOJ)
                                                                                                                                                                                                      READ AND PROCESS FEAT RECORD
                                                                                                                                                                                                                       CALL RFEAT (FEAT, JDX, INIT, IEDJ)
                                                                                          REINITIALIZE FOR EA CLASS
                                                                                                                                                                                                                                                                                                                                   IF (IPIC.NE. 9. AND. IALL.NE. 1)
                                        IF (ILOG.NE. @. AND. ILOG.LE.2)
                                                                                                                                                                                                                                          IF (IEDJ.CT.8) GOTO 408
                                                                                                                                                                                                                                                                                                               IF (IEDJ. CT. 8) COTO 468
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       IF (ISTM.LE.8) COTO 400
                                                                        FORMAT(8H CLASS ,619)
                                                                                                                                                                                                                                                                                                                                                                                                           IF (IEOFR. EQ. Ø) GOTO 5
                                                                                                                                                 HISC(N,J) =0.8
                                                                                                              DO 1 J=1,JD
DO 2 N=1,NHX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FRH=-1518
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         JR=KTR+5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           FRL=1E18
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   THE-IEI
                                                                                                                                                                    CONTINUE
                     CONTINUE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              FLL=1E18
                                                                                                                                                                                     1E07=8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           11:5
                                                                                                                                                                                                                                                                                             36966= 978
37668=
37166=
37266=
                                                                          35766= 957
                                                                                                                                                                                                                                                                                                                                                                                                                           37788=0#
                     35408= 18
                                                                                                                                                                                                      $439=C44
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 37956=044
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ##J=#999%
                                                                                            35888-C++
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  37988=C++
                                                                                                                                                                                                                          36588= 5
                                                                                                                                                 36166= 2
                                                                                                                                                                                                                                                                                                                                                                     7388=C#
                                                                                                                                                                    36288= 1
                                                                                                                                                                                                                                                                                                                                                                                       37588=
                                                                                                                                                                                    36388=
                                                                                                              35988=
                                                                                                                                                                                                                                          =8899C
                                                                                                                                                                                                                                                           36788=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       38188=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         38288=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         38366=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           38488=
```

1 WRITE(ITRACE, 958) LASV, IEOFR, NEPR, LB, NCAV, NCSDL, NCSDR,

NAMO,NAML,FIRO,FLAG,FRL,FRH,FLL,FLH FORMAT(9H CLASSX ,1015,2X,6E9.3)

42706= 958

12666=

RETURN

-86767		53450= IF	IF (L.EG.LASV. AND. IEDFR. EQ. 1) LAS=1
49583=		53506=	NB=NEUC
=8896	SUBROUTINE CDEFI (FEAT, CLAS, HISC, JDX, NHX, 1EOJ)	53688=	IF(ISYM.GT.1) NE-NI
3=8826		50769=	D0 198 J=1,JD
-0000t	COMMON/NAMES/INPF, 100TF, IFEAT, 10LDC, INEWC, 1LOGF, IMISC	50888=	KT=1
49968=	COMMON/TRACE/ILOG.ITRACE	53988=	11=9
-66663	COMMON/CRUM/NEXC.NTC	54666=	BLO=FIRS
58160=	COMMON/CONTRL/ IMOD, IALL, ISYM, ICAL, IPIC, IH, IS,	54188=	BHI=FLAS
56208=	1 TUKER, LABLE, LABLE, SIZE, IPK	54286=	IF(ISYM.LT.2) GOTO 128
-50000	COMPONITION FIRST FLAST FIRCT FLACTORUC, KTR.NI	54398=6+	SETUP FOR ASSYMETRIC BOX OPTION
56453=	COMMON/CREC/ LASV, IEOFR, NEPR, LB, MAXV	54480=	IF (FEAT (J.L.) . GT. CLAS (J.NCAV)) GOTO 118
58588=	NINOWAND WOOD WOOD WOOD WOOD WOOD WOOD WOOD WO	54508=0##	MEGATIVE IS LEFT SIDE
58662=	DIMENSION FEAT (JDX, 1), CLAS (JDX, 1), HISC (NHX, 1)	=86745	BHI=FLAC
58788=	EQUIVALENCE (AVEC, NVEC)	54708=	CALL STATX (#, FEAT (J, L), HISC(1, J), CLAS (J, NCAV)
58888-C++	SET UP CONSTANTS ON FIRST CALL	54800= 1	CLAS(J,NCSDL),1)
58986=	JF(100, Eg. 1) COTO 98	54988=	COTO 138
51989=	NI=(NEUC-8)/2	55668=C++	POSITIVE IS RIGHT SIDE
51166=	KTR=NHX/2 +1	55168= 118	CONTINUE
51260=	1:031	55268=	BLO=FIRC
51259=	D=707-3	553#0=	II=KTR+8
51388= 98	CONTINUE	55466=	KT=KTR
51488=0++	INIT TO BEGIN NEW CLASS	55566=	CALL STATX(6, FEAT(J, L), HISC(KT, J), CLAS(J, NCAV
51558=	8=S#7	55666= 1	CLAS(J) NCSDR) 11 )
51575=	IF (IUKER, CT. 8, AND.NBFR, EQ. 1)	5578.0=	C0T0 13g
51688=	1 NKER=KERGET (CLAS, JDX, NEXC, IEOJ)	5586g=C##	DEFINE SYMMETRIC CLASS
51763=	1E03±6	55980= 128	CONTINUE
51888=	9=7	56600=	CALL STATK(B, FEAT (J, L), HISC (KT, J), CLAS (J, NCAV
52888=0**	UPDATES CLASINEXC) I WITH	55100= 1	CLAS(J, NCSDL), Ø)
52188=C++	FEATURE VECTORS FROM THIS BLOCK	56288= 138	CONTINUE
52268= 168	CONTINU	56218=	IF (LAS.NE.1) GOTO 149
52306=			
52488=	IFIL. CT. LASV) COTO 298		
52586=	AVEC=FEAT(JD+1,L)		
52560=	IF (NVEC. GT. NKER. AND. NKER. GT. #)		
52788=	1 NXER=KERGET (CLAS, JDI, NEXC, IEDJ)		
528@#=C##	SKIP VECTOR LISTED IN HUSK		
52988=	IF (NVEC. EQ.NKER. AND. IUKER. EQ. 1) COTO 106		
2-89885			
53160=0++	CONTROLS ASSIMETRIC SDEV CALCS		
53268=0++	COMPUTES VECTOR STATS AND HISTOGRAM		
533gg=C##	MAY BE USED FOR MORE BASED STATS		
53488=C**			

0

CALL STATH(1,0.6.HISC(1,J) HISC(9.J) RB.FIRS.FLAC)
CALL STATH(1,0.6.HISC(9,J) HISC(KTR+8.J) NB.FIRC.FLAS) NOTE THAT AVISDLISDR, ARE NOT YET IN HISC ARRAY CALL STATH (1, g. g, HISC (1, J), HISC (9, J), NB, BLO, BHI) CALL S ATX (1, 8.8, HISC (KTR, J), CLAS (J, NCAV), CALL STATX(1, 8.6, HISC(1, J), CLAS(J, NCAV), CALL STATX(1,0.0,NISC(1,J),CLAS(J)NCAV), FORMAT(1X,15H CLAS DEFN FOR ,14,6H SYM= ,12/ I WRITE (ITRACE,957) LASY, NVEC, NKER, NEXC, IEOJ FORMAT(8H CDEFI, 815) IF(IH.NE.1) COTO 198 CALL STATH(0,FEAT(J,L),HISC(KT,J), IF (ILOG. GE. 2) WRITE (ILOGF, 983) NEIC, ISYM, LAST VECTOR OF CLASS
IF(ISYM.GT.1) COTO 135 LAST VECTOR OF CLASS IF(ISYM.CT.1) COTO 185 ASSYMETRIC LAST VEC HISC(II,J),NB,BLD,BHI) ASSYMETRIC LAST VEC I ((CLAS(J,NCAV), J=1, JD), FMARK, 2 (CLAS(J.NCSDL),J=1,JD),FMARK, 3 (CLAS(J.NR),J=1,JD) ,FMARK) IF (ILOG.NE. G. AND. ILOG.LE. 2) IF (LAS. NE. 1) GOTO 198 NORMAL EXIT CLAS (J, NCSDL), (f) CLAS (J, NCSDL), 1) IF (IEDFR.NE.1) COTO 300 IF (ISYM.LT.2) NR=NCSDL 1 (((18(1XE9.3)))) ) CONTINUE FMARK= . 999E99 CONTINUE COTO 148 CONTINUE CONTINUE CONTINUE CONTINUE NR=NCSDR RETURN 57888= 57988= 58888= 58188= 35288= 983 56428= 56438= 56431=C\*\* 56435= 185 56437= 54988=C++ 57888= 268 57168= 57268= 57368= 957 57462= 5625g= 14**8** 5629g= 58468- 366 961 =98595 56230= 135 56488= 56418= 56412=6\*\* 56415= 56888=044 566gg=C++ 567gg= 56228=C## 56248= 56245= 5630@= 56225= 56439= 57569= 57686= 57786= 58346= 56248=

```
INITIALIZE NEW CLASS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     F((J/MOD).NE.1) 60T0 28
                                                                                                                                                                     DRAW MASTER Y-AXIS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           MARK KERN POSITION
IF (ISOF.NE.2) COTO 25
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CALL MARK (98,468,3,3)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CALL MARK 198, 480, 3,8)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CALL MOVABS(IX, IY)
CALL MARK(IX, IY, 6,3)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CALL MARKITA, IY, 8,3)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CALL. MARKIIX, IY, 3, 8)
                                                                                                                                                                                                                                                                        CALL MOVABS(IX,IY)
CALL MARK(IX,IY,3,8)
                                                                                                                                                                                                                                                                                                                                                                                                                                                  CALL MARKITA, IT, 3, 8)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CALL MOVAES (188,68)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CALL MOVAES (98, 488)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CALL MOVAES (100,68)
                                                                                                                                                                                                                                                                                                                                                                                                                CALL DRUABS(IX, IY)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CALL MOVAES (IX, IY)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CALL MOVABS (185,66)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CALL PATABS (188, 68)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DRAW X-AXIS
                                                                                                                                                                                                                                                                                                                                             DO 16 Je1,11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                00 26 J=1,JD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CINCX=888/CD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CALL ANYONE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                IX=IX+INCX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   MOD=MOD+5
                                                                                                                                                                                                                                                                                                                                                                                     1×=11-58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CONTINUE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CONTINUE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CONTINUE
                                                                                                                                                                                                     901=XI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1X=166
                                                                                                                                                                                                                                          1Y=658
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MOD=5
                                                                     161366= 988
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     102560=C+
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             183518=
183528=
183686= 28
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   183755=
183855=
183815=C**
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           183838=
183858=
163858=
163858=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                102500= 18
##3=99199
                                                                                                                                                                        143-659191
                                                                                                                                  -802101
                                                                                                     =885:0
                                                                                                                                                                                                                                        -83818
                                                                                                                                                                                                                                                                                                          $2000°
                                                                                                                                                                                                                                                                                                                                             62169=
62166=
                                                                                                                                                                                                                                                                                                                                                                                                                62366=
                                                                                                                                                                                                                                                                                                                                                                                                                                                  -391791
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     102000=
102900=
103000=
103050=
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DATA KHD(1), KHD(2), KHD(3), KHD(4), KHD(5), KHD(6),
                                                                                                                                                                                                                                                                                                                                                             COMMON/DIST/FIRS, FLAS, FIRC, FLAC, NBUC, KTR, NI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                COMMON/HFILE/ MAXKV, NCIX, NENT, MSCAL, MZAPD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  COMMON/CLID/NCAV.NCSDL,NCSDR,NCMAX,NCMIN
DIMENSION CLAS(JDX,1), FEAT(JDX,1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  COMMON/CREC/ LASV, IEOFR, NDPR, LB, MAXV
                                                                                                                                                                                  SUBROUTINE FANDER(CLAS, JDX, FEAT, IEDJ)
PROJUCES COMPONENT CLUSTER PLOT
COMMON/TRACE/ILCO: ITRACE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   4HUNIV, 4HERSE, 4H , 4HCLAS, 4HS
                                                                                                                                                                                                                                                                                                                             COMMON/PCLUS/ICPS, IQUIK, ISCF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             IF (NEXC.EQ.LASC) COTO 188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (P) GH3; (S) GH3; (L) GH3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                4HMAHA, 4HLANA, 4HOBIS/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                EQUIVALENCE (AVEC, NVEC)
                                                                                                                                                                                                                                                                                             CONYON/CHUM/NEXC, NTC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     IF (100, EQ. 1) GOTO 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DIMENSION KHD(9)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CALL INITT(ICPS)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CONTINUE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                E-X07=05
```

SETUP KERNEL IF (IUMER.ED.1) NKER:KERGET (CLAS.JDX.NEXC.1EDJ)

FORMATICX, 1981 FEATURE COMPONENTS)

186 = 201431 184288°C\*\*

WRITE (10UTF, 981)

-99866

-89266

98868= 99868= 99868= 99868= 99868= 99868= 99868= 99868=

98199= 66268=

-30000

69168- 1

98568=C++

-88728

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IF(IT.CT.6.). AND. IABS(ISYN). EQ. 2) NCS=NCSDR
                                                                                                                                                                                                                                                                                                                                                                                                                                               IF(ILOG.NE.8.4ND.ILOG.LE.2)
1 WRITE(ITRACE.957)LASC,IEDJ.NKER.NEXC.ICH
FORMAT(18% FANDER ,815)
                                                                                                                                                                                            IFIIGUIN.ED.1) CALL MARK(IX,II,2,6)
IFIIGUIN.ED.8) CALL DAWABS(IX,IY)
                                                                                                                                                       IY= ((F-BLO)/BSPAN) +688.+188.
                                                                  F=FEAT (J,L)
IF (ISCF,NE,2) G0T0 128
                                                                                                                                                                                                                                                                                                                     IF (IEOFR. NE. 1) GOTO 608
                                                                                                                                                                              IF (J.EQ.1) GOTO 198
                                                                                                       T=F-CLAS(J,NCAV)
                                                                                                                                                                                                                                                                                 CALL MOVAES (SEE, 168)
CALL DEURSR (ICH, IX, IY)
                                                                                                                               F=T/CLAS(J,NCS)
                                                                                                                                                                                                                                CALL MOVASS(IX, IY)
                PLOT COMPONENTS
                                                                                                                                                                                                                                                         PAUSE FOR COPY
                                                                                                                                                                                                                                                                                                                                                                                               CALL ANMODE
EXIT ROUTINE
                                                                                                                                                                                                                                                                                                                                                                      DO 444 J=1,19888
                                                                                                                                                                                                                                                                                                                                              CALL ERASE
WAIT LOOP
                                                                                          NCS=NCSDL
                                                                                                                                                                     [X=[X+]NCX
                                                                                                                                                                                                                                              CONTINUE
                                                                                                                                                                                                                      CONTINUE
                                                                                                                                                                                                                                                                                                                                                                                   CONTINUE
                                                                                                                                                                                                                                                                                                                                                                                                                      CONTINUE
                                                                                                                                                                                                                                                                       CONTINUE
                                                                                                                                                                                                                                                                                                           CONTINUE
                             831=XI
                                          1Y=188
                                                                                                                                                                                                                                                                                                                                   LASC=B
                                                                                                                                                                                                                                                                                                                                                                                                                                    1E0.J=@
                                                                                                                                                                                                                                                                                                                                                                                                                        118388= 688
118488=
                                                                                                                                                                                                                                                                      189812= 368
189815=
                                                                                                                                                                                                                                                                                              189928= 488
                                                                                                                                                                                                                                                                                                                                                                                                                                                            118488=
118788= 957
                                                                                                                                                                                                                     189588= 198
189588=
                                                                                                                                                                                                                                                                                                                                                          118152=C##
118153=
                                                                                                                                            88999= 128
                                                                                                                                                                                                                                              69768= 266
                                                                                                                                                                                                                                                                                                                                                                                                          18266=C++
                                                                                                                                                                                                                                                        $9818=C**
                                                                                                                                                                                                                                                                                                                                                                                               10156=
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119156=
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                                                                                                                                                                                            =898691
                                                                                                                                                                                                                                                                                                                                                                                                                                               10500=
                                                                               183488=
                                                                                          108666=
                                                                                                                 =90789
                                                                                                                                                       =898681
                                                                                                                                                                                                         -664601
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    116828=
                                                                   =998391
                                                                                                                                                                                                                                                                                                                                                       WALTE (10UTF, 900) NETC, (XHD(K), K=K1, K2), BLD, DHI
PLOT VECTORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 IF (NVEC. EQ. NVER. AND. IUKER. EQ. 1) GOTO 366
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   I NKER-KERGET (CLAS, JDX, NEXC, IEOJ)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       IF (NVEC. CT. MIER. AND. MKER. CT. 8)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    IF (ICH. NE. 32) 60TO 468
                                     IF (150F.NE.8) COTO 36
                                                                                                                                        IF (ISCF.NE.1) COTO 48
                                                                                                                                                                                                                                                                               WRITE PACE HEADER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CALL DCURSR (ICH, IX, IT)
CALL ANNODE
SETUP CLASS PROCESS
LASC=NEXC
                                                                                                                                                                                                                 IF (150F.NE.2) GOTO 58
                                                                                                                                                                                                                                                                                           CALL MOVAES (198,748)
                                                                                                                                                                                                                                                                                                        CALL MOVAES (168,746)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CALL MOVAES (SEE, SEE)
                         SETUP CONSTANTS
                                                                                                                                                                                                                                                                                                                                                                                                                                                       IF (L1.NE.8) SOTO 68
                                                                                                                                                                                                                                                                                                                                                                                                       LK=.3*FLOAT(LASV)
DO 360 L=1,LASV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AVEC=FEAT (JD+1,L)
                                                  CLOBAL SCALES
                                                                                                                                                    LOCAL SCALES
                                                                                                              SSPAN=FLAS-FIRS
                                                                                                                                                                                          BSPAN=FLAC-FIRC
                                                                                                                                                                                                                                                                                                                  K1=3*150F+1
                                                                          K1=3+150F+1
                                                                                                                                                                                                                                                                                                                                           CALL ANYONE
                                                                                                                                                                                                                                                                                                                                                                                                                                             11=L-L1+LK
                                                                                                                                                                                                                                                     BSPAN=12.
                                                                                                                                                                            BHI=FLAC
                                                              BLO=FIRS
                                                                                                    BHI=FLAS
                                                                                                                                                                                                                             BL0=-6.
                                                                                                                                                                                                                                                                                                                                                                                           CONTINUE
                                                                                                                            $5 0100
                                                                                                                                                                  BLO-FIRE
                                                                                                                                                                                                     G0T0 56
                                                                                                                                                                                                                                                                    CONTINUE
                                                                                        K2=K1+2
                                                                                                                                                                                                                                                                                                                                                                                                                                LI=L/LK
                                                                                                                                                                                                                                            BHI=6.
                                                                                                                                                                                                                                                                                                                                 K2=K1+2
                                                                                                                                                                                                                                                                                                                                                                  196198=C+++
196265=C++
196390= 188
                                                                                                                                       105289= 38
                                                                                                                                                                                                                                                                  184858= 58
184858=C++
184852=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   186988=C++
187888=
                                                                                                                                                    85388=C++
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    187468=
                           $49:689t8
                                                                                                                                                                                                                 82768= 48
                                                   #13=098t0
                                                                                                                                                                                                                             185858=
185858=
18598E=
                                                               -805518
                                                                          =87658
                                                                                                   -65610
                                                                                                               -86656
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                                                                                        64936=
                                                                                                                             95169=
                                                                                                                                                                                                                                                                                                                                                       =856961
                                                                                                                                                                                                                                                                                                                                                                                                       -882981
                                                                                                                                                                                                                                                                                                                                                                                                                               -802991
                                                                                                                                                                                                                                                                                                                                                                                                                                                       -66394
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            187188=
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COMMON/NAMES/INPF, 10UTF, IFEAT, 10LDC, INENC, IHISC COMMON/KFILE/MAXKV, NCIX, NENT. MSCAL, MZAPD FORMATIZE, 1484USK FOR CLAS-13 )
NUMM-KENGET (CLAS-UDX, MEXC. IED.)
IF (IED.CT.8) COTO 28
IF (NUMH.LE.8) COTO 28 PRINTS HUSK FOR CURRENT CLASS SUBROUTINE PHUSK (CLAS, JDX, IEDJ) COMMON/KVEC/KK, ILIS(15), ISA FORMAT (2X, 2HP= , 15(13, 1X) ) WRITE(ILOGF, 981) NEXC WRITE(10UTF, 988) ILIS WRITE (10UTF, 981) NEXC WRITE (ILOCF, 988) ILIS COMMON/CNUM/NEXC,NTC IF (KIX.LE.15) COTO 5 INTEGER CLAS(JDX,1) ILIS (KIX) = NUMH NORMAL EXIT (IX=KIX+1 CONTINUE RETURN 25.00=0++
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CLAS (JB+1,NCMIN) =F# DIMENSION CLAS(JDX,1), FEAT(JDX,1) IF (IEOJ. CT. 8) COTO 368 NO MORE ROOM ERROR CLAS (JD+2,NCMIN) =FM2 CLAS (JD+3,NCMIN) =F98 CLAS (JD+1,NCMAX) =FØ CLAS (JD+2,NCMAX) =FM1 CLAS (JD+3,NCMAX)=F99 CONTINUE CONTINUE 1E0J=5 COTO 200 END JD=JDX-3 RETURN INIT=2 155768=C++ 155868= 208 56100= 386 154588=C## 56888=C++ 54718=044 54666= 54782= 54728= 55988= 56288= -885951 55688= 55588= 55688= 51986= 152188= 54788= 54888= 151888= 152008= 152656= 52388= 52318=

APPENDIX G
TRYOUT Module

IF (ISUB.EG.1) CALL WRCLAS (WO (NCI) , JDX , ICX , 6 , LABLC) FORMAT(27H CLAS AND FEAT NOT MATCHED) END JOB IF(IEOJ.E9.3)WRITE(ILOGF,982) FORMAT(2X,20H TOO LITTLE MEMORY \*\*\*\*\* PRINT ERROR MESSAGES IF(IE0J.EQ.4) WRITE(IOUTF.983) IF(IEOJ.EQ.2)WRITE(IOUTF.981) FORMAT(2X,13H QUIT TRYOUT) IF (IEOJ.EG.1) WRITE (IOUTF, 908) FORMAT (2X, 1H ) CONTINUE CONTINUE STOP £86 = 3891 3788= 868 206 - 3031 4288= 981 296 = 295 4628= 858 3666=C++ 1618=C++ 4586= 4168= 3966= PROGRAM TRIOUT (FEAT, OLDC, NEWC, LOGF=64, INPUT=64, OUTPUT=64) COMMON/NAMES/INPF, IOUTF, IFEAT, IOLDC, INEWC, ILOGF, IHISC COMMON/CONX/LCID(51,3), SCALE(2), ICONF, ANS(3), IMAG CALL EVAL (WO (NFI), WO (NCI), WO (NAI), JDX, NAX, IC, IEOJ) CORMON/PARAM/MEMC. MEM. NAX. JDX. ICX. NCI. NFI. NAI. IC CALL MERIT (WO (NTI), WO (NDI), WO (ND2), WO (NCI), JDX) IF (ISUB.EQ.1) CALL SUBSET (WO (NC1), JDX, ICX, IEQJ) CALL PRCLAS (40 (NC1) + 40 (NC1) + 40 (NC1) + JBX + ICX) 27 OCT 78 VERSION JRL -- TRYBB DUMP CLAS FILE IF NOT YET DONE IF(IFIG.CT.0)CALL FICK(WO(NTI), JDX, IEOJ) IF(IEOJ.CT.0) COTO 860 COMMON/TRY/IFIG, ISUB:NTI, NDI, ND2, LABLC CALL DOCU(NO(NAI), NO(NCI), JDX, NAX, IC) \*\*\*\*\* EVALUATE CLASS PROTOTYPES CALL INDEX (HO (NCI), JDX, ICX, IEDJ) CALL RFEAT(WO(NFI), JDX, INIT, IEOJ) GOTO 12 IF (ISUB+IFIG.LT.1) COTO 858
RESET FOR NEXT TRY CALL LOADC (WO (NC1), JDX, ICX) COMMON/TRACE/ILOG, ITRACE IF (IE0J.CT.8) COTO 888 IF (IE0J.CT.8) COTO 868 IF (IE0J.CT.8) COTO 888 IF (IFIG.NE.1) GOTO 12 COMMON NO (8288) CALL DEFT(1EDJ) DO 5 M=1, MEM IF (1L06.6T.2) MEM-8200 WO (K) = 0. CONTINUE CONTINUE CONTINUE INIT=1 1788= 18 1868= 18 1958= 2658= 2158= 12 2268= 1368=0++ 3266=C+++ 2988=C### 886= 986= 1166= 1165= 1286= 5 2588= 3158=

```
NATIE (ITRACE, 957) SCALE, NTC, IC, NAY, NFI, NCI, NTI, NAI, ILOG, ICONF
                                                                                                                                                                                                                                        MENK-MEN-(NAX+IC)-JOX+LB - JOX+ICX - JOX+7
                                                     IF (ICONF.LT. Ø. OR. SCALE (1).LT. Ø.) 6010 38
                                                                                        CALL OPENY(#, #, LABLC, LABLF, IEOJ)
SET MENORY CONTROL PARAMETERS
                     FILLOG.NE. B) WRITE (ILOGF, 984) 10PNS
       IF (ILOC.NE. B) WRITE (ILOCF, 981)
                                                                                                                                                                                                                                                                                                         FILLOG.NE.S. AND. ILOG. LE. 2)
                                                                                                                                                                                                                                                                                                                                           FURNATION DEFT , 2E9.3,916)
                                       IF (SCALE (1), CT.1.) MSCAL=1
                                                                          OPEN DATA FILES
                                                                                                                                                                                                                                                                                                                                                                          TOO LITTLE NEWOR!
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CALL ERR(IOUTF, KN. 1E0J)
IF(1E0J, LT. 6) GOTO 5
GOTO 26
                                                                                                                                                                                                                                                       IF (MENK, LT. Ø) 60T0 25
                                                                                                                                                                                                                                                                           NORMAL EXIT
                                                                                                                                                                                                                                                                                                                                                                                                                                          ERROR RETRY
                                                                                                                                                          NCI=NFI+JDX+LB
                                                                                                                                                                                          NTI=NAI+NAX+IC
                                                                                                                                                                                                         NDI=NTI+54JDX
                                                                                                                                                                           NAI = NCI + NENC
                                                                                                                                                                                                                          ND2=ND1+JDX
                                                                                                                         NAX=NTC+1
                                                                                                                                                                                                                                                                                          CONTINUE
                                                                                                                                                                                                                                                                                                                                                                                         CONTINUE
                                                                                                                                                                                                                                                                                                                                                                                                                                                          CONTINUE
                                                                                                                                                                                                                                                                                                                                                                                                                          G0T0 28
                                                                                                                                          NF1=1
                                                                                                                                                                                                                                                                                                                                       11688= 957
                                                                                                                                                                                                                                                                                          1369= 28
                                                                                                                                                                                                                                                                                                                                                                                         1968= 25
                                                                        ++3=06000
                                                                                                          18280=C++
                                                                                                                                                                                                                                                                         1260=C++
                                                                                                                                                                                                                                                                                                                                                                          1869=C++
                                                                                                                                                                                                                                                                                                                                                                                                                                        2288=C++
                                                                                                                                                                                                                                                                                                                                                                                                                                                          2368= 36
                                                                                                                          -86861
                                                                                                                                                                                        -88891
                                                                                                                                                                                                                                        -9001
                                                                                                                                                                                                                                                      1198=
                                                                                                                                                                                                                                                                                                        -964!
                                                                                                                                                                                                                                                                                                                                                         11786=
                                                                                                                                        =9919
                                                                                                                                                                        =83781
                                                                                                                                                                                                                       -8968
                                                                                                                                                                                                                                                                                                                                                                                                                        12:66=
                                                                                                                                                          -00501
                                                                                                                                                                                                                                                                                                                          11588=
                                                                                                                                                                                                                                                                                                                                                                                                         12808=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        2460=
                                                                                                                                                             DATA INP. INC. INA. INA. INS. INS. INS. INC. INY. INF. INT. INZ. INT. INS
                                                                                                                                                                           I /IMP. INC. INA, INM, INW. IND. INW. INL. INT. INT. INI. INZ. INT. INS.
                               COMMON/MAMES/INPF,IOUTF,IFEAT,IOLDC,INEWC,ILOGF,IHISC
COMMON/TRACE/ILOG,ITRACE
                                                              COMMON/CONX/LCID(51.3).SCALE(2).ICONF.ANS(3).IMAG
COMMON/PARAM/WEMC.WEM.NAX.JOX.ICX.NC1.NF1.NA1.IC
                                                                                                                                                                                                                                                                                                                                                                                            FORMAT (9H TRYOUT /15H ENTER OPTIONS/2H +)
                                                                                                           COMMON/KFILE/MAXKV,NCIX,NENT;NSCAL,MZAPD
COMMON/TRY/FFIC, ISUB:NT;NDI;NDZ;LABLC
                                                                                              COMMON/CREC/LASV, JEOFR, NBPR, LB, MAXV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            IF (IOPNS (I) . EQ. IHW) SCALE (I) = 32768.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            IF (10PNS(1).EQ.1HN)SCALE(1)=1.
IF (10PNS(1).EQ.1HB)SCALE(1)=256.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             IF (IOPNS (I) .EQ. IHC) ICONF=2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              IF (IOPNS(I), EQ. IHA) ICONF=8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              IF (IOPWS (I) . EQ. INF) IF IC=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             IF (IOPNS (I) .EQ. IHP) ICONF=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              IF (10PNS (1), EQ. IHM) IMAG=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             IF (IOPNS (I), EQ. INL) ILOG=3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             IF (IOPNS (I) . EQ. IHY) ILOG=2
                                                                                                                                                                                                                                                                                                                                                               GET USER OPTIONS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             IF (IOPNS (I) .EQ. IHT) ILOC=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             IF (IGPNS (I) . EQ. IHS) ISUB=1
SUBROUTINE DEFT(TEQJ)
                                                                                                                                                                                                                                                                                                                                                                                                             READ (INPF, 903) IOPNS
                 COMMON/CNUM/NEXC,NTC
                                                                                                                                            DIMENSION TOPNS(7)
                                                                                                                                                                                                                                                                                                                                                                              URITE (TOUTF, 981)
                                                                                                                                                                                                                           IOUTF=6LOUTPUT
                                                                                                                                                                                                                                                                                                                                                                                                                               FORMAT (1X, 7A1)
                                                                                                                                                                                                                                                                                                              TRACE=4LLOGF
                                                                                                                                                                                                             INPF=5LINPUT
                                                                                                                                                                                                                                             FEAT=4LFEAT
                                                                                                                                                                                                                                                              INENC=4LNENC
                                                                                                                                                                                                                                                                            OLDC=4LOLDC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SCALE(1)=-1.
                                                                                                                                                                                                                                                                                              ILOGF = 4LLOGF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SCALE (2)=8.
                                                                                                                                                                                                                                                                                                                                                                                                                                              FORMAT (7A1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              7,1=1 81 00
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ICONF=-1
                                                                                                                                                                                                                                                                                                                            E07=-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                               BEIC-0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               D=gnsI
                                                                                                                                                                                                                                                                                                                                                                                                                              7988= 984
                                                                                                                                                                                                                                                                                                                                                                                              7588= 981
                                                                                                                                                                                                                                                                                                                                                               7238=0##
                                                                                                                                                                                                                                                                                                                                                                             7388=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             9588=
9688=
9788=
9888=
                                                                                                                                                                                                                                             -8659
                                                                                                                                                                                                                                                                            6788=
                                                                                                                                                                                                                                                                                             -68899
                                                                                                                                                                                                                                                                                                                           7138=
                                                                                                                                                                                                                                                                                                                                                                                                                                                              -8666
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             9188=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            -8676
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -9226
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               -2916
                                                                                             5798=
5758=
5758=
5768=
6468=
                                                                                                                                                                                           6288=
                                                                                                                                                                                                             -68669
                                                                                                                                                                                                                           -66919
                                                                                                                                                                                                                                                              -66999
                                                                                                                                                                                                                                                                                                              -8869
```

FIG.1)--> GRAND PRODUCT OF UCITICU VECTORS FIG.2)--> GRAND SUM OF FIG.4.4. #FIG.5 FIG.3)--> GRAND SUM OF ALL ICU AND UCI VECTORS FOR ALL CLASS PAIRS COMMON/SACH/ISX,IKNO,NIC,JD,ITAC(50),DIS(50),RATE(2,50) COMPUTES A FIGURE OF MERIT FOR EACH DIMENSION PRINTS INTERMEDIATE MEASURES OF CLASS WORTH FT(J,4)--> PRODUCT OF ICU VECTORS FOR CLASS I FT(J,5)--> PRODUCT OF UCI VECTORS FOR CLASS I SUBROUTINE MERIT(FT.DISI.DISM.CLAS.UDX)
CORMON/NAMES/INPF.10V1F.1FEAT.10LDC.INEWC.1LOGF.IHISC
CORMON/TRACE/ILOG.1TRACE COMMON/CONX/LCID(51.3), SCALE(2), ICONF, ANS(3), IMAC DIMENSION FT(JDX,5),CLAS(JDX,1)
DIMENSION DISN(JDX),DISI(JDX)
DATA LABLI,LABLU/4HICU ,4HUCI / COMMON/CNUM/NEXC, NTC JD=JDX-3 DO 10 J=1,JD FT(J,1)=1. FT(J,4)=1. FT(J,5)=1. FT(J,2)=1.6 FT(J,3)=6.6 57288=C++ 57388=C++ 57488= 57508= 57686= 57768= 57969= 58688= 18 57888=C++ 57188=C++ 563gg=C++ 56788=C++ 56788=C++ ##J=8859S ##J=##39999 5690B=C++ 56488=C+4 55.508 5.508

```
IF(ILOG.NE.8)KRITE(ILOGF.988)LABLI.I.N.VWWAG.(DISK(J).J=1.JD)
IF(ILOG.NE.8)KRITE(ILOGF.988)LABLU.N.I.VIMAC.(DISI(J).J=1.JD)
FORMAT(2X.A4.2XI3.4H TO .I3.6KWMAG= .E8.2/(((18(IXES.3)))))
                                                                                                                                                                                                                                                                                                                                              FORMATICX, GHOLASS , 12, 18H AS SEEN BY REST , SH VMAG= , E8.2/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     INTERMEDIATE MERIT FIGURES, 14/(((18(1XE9.3))))
                                                                                                                                                                                                                                                                                                                                                                                    53988= 982 FORMAT(2X,23H REST AS SEEN BY CLASS ,12,8H VMAC= ,E8.2/
                                                                                                                                                                                                                                                                                   IF (ILOC.NE. 3) WRITE(ILOCF, 984) I, VKMAG, (FT(J, 3), J=1, JD)
                                                                                                                                                                                                                                                                                                       IF(ILOG.NE.B)WRITE(ILOGF,981)I,VNYAG,(FT(J,4),J=1,JD)
IF(ILOG.NE.B)WRITE(ILOGF,982)I,VIYAG,(FT(J,5),J=1,JD)
                                                                                                                                                                                                                                                                                                                                                                                                                             FORMAT(2X,12,15H CLASS MERIT= , 8H VMAC= ,E8.2/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   IF(ILOG.NE.6)WRITE(ILOGF,985) I,(FT(J,K),J=1,JD)
                                                                                                                                                                                 PRINT MERIT FIGURES FOR EACH CLASS
PROCESS EACH CLASS PAIR IF OPTED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RETURNS WITH FT(J,1)-->PLOG F/M
RETURNS WITH FT(J,2)-->PSUM F/M
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      COMPUTE GRAND MERIT MATRIX
                                                                                                                                                                                                                                          VIMAG=SORT(ENER(FT(1,4),JD))
                                                                                                                                                                                                                        VNMAC=SORT (ENER (FT (1,5),JD))
                                                                                                                                                                                                                                                                   VKMAG=SORT (ENER (FT (1,3), JD))
                                        VNMAC=SORT (ENER (DISN, JD))
                                                             VIMAG=SORT (ENER (DISI,JD))
                  IF (ILOG.NE.1) GOTO 118
                                                                                                                                                                                                      IF (ILOG.NE.3) GOTO 152
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         FT(J,2)=FT(J,2)*FT(J,5)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           IF (ILOC.NE.1) COTO 200
                                                                                                                                                                                                                                                                                                                                                                                                            1 (((1g(1XE9.3))) ) )
                                                                                                                                                                                                                                                                                                                                                                   1 ((((£(1XE9.3))) ) )
                                                                                                                                                                                                                                                                                                                                                                                                                                                   1 (((18(1XE9.3)))) )
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    FT(J,1)=FT(J,1)+T1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DO 168 J=1,JD ..
TI=ALOC(FT(J,4))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DO 199 K=1,5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          FORMAT (28H
                                                                                                                                          CONTINUE
                                                                                                                                                                CONTINUE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CONTINUE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CONTINUE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CONTINUE
                                                                                                                                          62988= 118
62988= 158
                                                                                                                                                                                                                                           63288=
63388=
65438=
60588=
63588=
63738= 981
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              65488=
65588=
65688= 985
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          65788= 199
65886= 288
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   65988=C**
66988=C**
66188= 368
                                                                                                                     206 = 98273
                                                                                                                                                                                                                                                                                                                                                                                                                           64198= 984
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       5435@= 152
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        55288= 168
                                                                                                                                                                                 53888=C++
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ##3=82C+9
                                                                                                                                                                                                                                                                                                                                                                                                          =600059
                                                                              52588=
                                                                                                                                                                                                                                                                                                                                                                                                                                                 =80719
                                                           -66977
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             64688=
64888=
65188=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -00CS9
                                                                                                   62600=
                                                                                                                                                                                                      53858=
                                                                                                                                                                                                                       63166=
                                                                                                                                                                                                                                                                                                                               DIM EVAL --> (PROD: DISI + PROD: DISN) N=1+1:NTC
 PICK EACH MEMBER OF CLAS FILE AS AN UNKNOWN
                                                                                                                                                                                                                                                                                                          CLAS I EVAL --> SUM: (DISI*DISN), N=1,NTC
                                                                                                                                             LOOP THRU CLAS FILE DOING RECOGNITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 IF (CLAS(J, NCAV) . GE. CLAS(J, ICAV) . AND. ISYM. EQ. 2)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    IF (CLAS (J. ICAV) . GE. CLAS (J. NCAV) . AND. NSTM. EQ. 2)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           IFICLAS(J, ICAV) .LT.CLAS(J, NCAV) .OR.NSTM.EQ. 1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          IF (CLAS(J, NCAV) . LT. CLAS(J, ICAV) . OR. ISYM. Eg. 1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GENERATE CLASS PERSPECTIVE FIGURES
                                                                                                                                                                                                                                                                                                                                                                      CLEAR AND INITIALIZE ON FIRST N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DFEA=ABS(CLAS(J, ICAV)-CLAS(N, NCAV))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           FT (J, 3) = FT (J, 3) +DISI (J) +DISN(J)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    FT (J, S) = FT (J, S) + DISI (J) + DISN (J)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DISI(J) = DFEA/CLAS(J, ICSDL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1 DISN(J) = DFEA/CLAS(J,NCSDL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1 DISN(J) = DFEA/CLAS(J,NCSDR)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1 DISI(J) = DFEA/CLAS(J, ICSDR)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CLAS - UNKNOWN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FT (J,4) =FT (J,4) #DISI (J)
                                                                                                                         IF (ICSDR.CT.8) ISYN=2
                                                                                                                                                                                                                                                                                         IF (NCSDR. GT. 1) NSYM=2
                                                                                                                                                                                      IF (N. EQ. I) GOTO 158
                                                                                                                                                                                                                                                                                                                                                                                         IF (N.NE.11 COTO 86
                                                                                                                                                                                                                             NCSDL=LCID(N,2)
                                                                                ICSBR=LCID(1,3)
                                                                                                                                                                                                                                                  NCSDR=LCID(N,3)
                    00 208 I=1,NTC
                                                              ICSDC=CCID(1,2)
                                                                                                                                                                 DO 150 N=1,NTC
                                                                                                                                                                                                         NCAV=LCID(N,1)
                                          CAV-LCID(1,1)
                                                                                                                                                                                                                                                                                                                                                     DO 168 J=1, JD
                                                                                                                                                                                                                                                                                                                                                                                                                                  FT(J,5)=8.8
                                                                                                                                                                                                                                                                                                                                                                                                               FT(J,4)=1.6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CONTINUE
                                                                                                                                                                                                                                                                                                                                                                                                                                                      CONTINUE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CONTINUE
                                                                                                      ISYN=1
                                                                                                                                                                                                                                                                      NSYM=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         61988= 95
                                                                                                                                                                                                                                                                                                                                                                                                                                                68 -68589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         68588=C##
                                                                                                                                                                                                                                                                                                                                                                    ##J=8866
                                                                                                                                                                                                                                                                                                             849-8895!
                                                                                                                                                                                                                                                                                                                                $700-C++
                                                                                                                                             $88£5=C##
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1408=044
                                                             -86199
                                                                                                   -62989
                                                                                                                                                                 -8868g
                                                                                                                                                                                                                             -88769
                                                                                                                                                                                                                                                59386=
                                                                                                                                                                                                                                                                                                                                                   =8836
                                                                                                                                                                                                                                                                                                                                                                                          -0000
                                                                                                                                                                                                                                                                                                                                                                                                            -98199
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -20169
                                                                                                                                                                                                          59166=
                                                                                                                                                                                                                                                                                       -88956
                                                                                                                                                                                                                                                                                                                                                                                                                                -8979
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             -689989
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 58788=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -99899
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               -22919
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 61788=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         -98699
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            -63619
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                51128=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 61286=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       61866=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       61300=
```

RETURN

```
IF (ILGG.EG.1.0R.ILGG.EG.2) WRITE (ILGGF.984) (ITAG(K), K=KK,KN)
                                                                                                                                                                                                                                                                                                                QUIT AT TAC=99, OR ENTRY NO > (JD.OR.58)
                                                                                                                                                                                                                                                                                                                                ZERO NTAC(I) IF 'SLOT' SPECIFIED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 IF (ILOC. NE. 6) WRITE (ILOCF, 988) (ITAC(J), J=1, JB)
                                                                                                                                                                                                                                                         IF (ILOG.EG.1.0R.ILOG.EG.2) WRITE (ILOGF,982)
                                                                                                                                                                  READS TAG-LIST "TIL 99 ENTRY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  FORMAT(15H SUBSPACE TACS/, (((2013))))
                                                                                        FORMATIZTH SPECIFY SUBSPACE TAGS
                                                                                                                                                                                                                                                                           READ(INPF, 903) (ITAC(K), K=KK, KN)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SLOT NON-ZERO NTAGS
                                                                                                                                                                                                                                                                                                                                                                                                                          IF(ITAC(I), E9.99) 60T0 42
                                                                                                                                                                                                                                                                                                                                                                                                       IF (ITAC (1), EQ. 6) GOTO 33
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        IF (NTAC(II), EQ. 8) COTO 43
                                                                                                                                                                                                                                                                                                                                                 DO 35 I=1.28
IF(KK.CT.JD) COTO 58
IF(KK.CT.58) COTO 58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CALL ERR (TOUTF, 6, TEDJ)
                                                                                                            1 11H KK, KK, ... / 2H +1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         IF (IEQJ. GT. 8) COTO 58
                                                                                                                                               FORHAT (1X, 28 (12, 1X))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ERROR' RETRY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NORMAL EXIT
                                                                                                                                                                                                                        IF IKN. CT. 58) KN=58
                                                                                                                          FORMAT (28(12,1X))
                                                                                                                                                                                                                                        WRITE (IDUTE, 982)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TAG (J) =NTAG (II)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DO 44 J=KK, JD
                  DO 32 I=1.58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                NTAC (KX) = 6
                                     NTAG (1)=1
                                                       17AC(1)=@
                                                                                                                                                                                                                                                                                                                                                                                                                                              KX=ITAG(I)
CONTINUE
                                                                                                                                                                                  CONTINUE
                                                                                                                                                                                                       KN=KK+19
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CONTINUE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CONTINUE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CONTINUE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     COTO 33
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CONTINUE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CONTINUE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 KK=KK+1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             COTO 31
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1=11+1
                                                                           KK=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   9=1
                                                                                                                                                                                                    72286=
72386=
72586=
72586=
72586=
72886=
72886=
                                                                                                                           1880= 983
                                                                                         1608= 902
                                                                                                                                               1956= 984
                                                                                                                                                                  75056=0+++
                                                                                                                                                                                                                                                                                                                                72983=C+++
                                                                                                                                                                                  7168= 33
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             73766=
73866= 35
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      74105= 48
 71166= 31
                                                      1480= 32
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           4588=C###
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 74688= 42
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     4988= 43
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               5460= 50
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       43000-C++
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           5266= 44
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             153@8=C++
                                                                          1566=
                                                                                                            71708=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  13988=
                   1269=
                                      11308=
                                                                                                                                                                                                                                                                                                                                                     73666=
                                                                                                                                                                                                                                                                                                                                                                    73166=
73266=
73386=
                                                                                                                                                                                                                                                                                                                                                                                                                        73408=
73508=
73566=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         4308=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             -66655
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   48882
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         -56605
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         5100=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   -83/5
                                                                                                                                                                                                                                                                IF (ILOC.NE.S)WRITE(ILOCF,981)MNAM(M), (ITAC(J),DIS(J),J=1,JD)
                                                                          COMMON/SECH/ISK.IKNO.NIC.JD.ITAC(SØ),DIS(SØ),RATE(2,SØ)
DIMENSION FI(JDX,S),ANAM(2)
                                                          COMMON/NAMES/INPF, IDUIT, IFEAT, IOLDC, INEWC, ILOCF, IHISC
                                                                                                                                                                                                          OUTPUT FIGURE OF MERIT FOR EACH DIMENSION
                                                                                                                                                                                                                                                                                               FORKAT(ZX.A4.34H FIGURES OF MERIT FOR DIMENSIONS I (((8( ZX.12.1H=,E10.4) )))
                                                                                                                                                                                                                                                                              WRITE(IDUTF,901) MNAM(M), (ITAC(J),DIS(J),J=1,JD)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    IF (ILDG.EQ. 1. OR. ILOG.EQ. 2) WRITE (ILOGF, 967) N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  # --> USER SETS SUBSPACES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 N= 1,2--> SELECT F/M SUBSPACE
                                                                                                                                                                                                                                                                                                                                                                                                                              FORMAT (1X, 13, 24H =FIG-MERIT SUBSPACE SET
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        END OF INPUT LIST
                                                                                                                                                                                                                                                                                                                                                                                          TORNAT (22H ENTER FIM SET NUMBER, /ZH +)
                                                                                                                                                                                                                                                                                                                                                        SUBSET FIG/MERIT -- > SUBSPACE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        --> END OF TRYOUT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SUBSPACE TAG
                                                                                                                                                    DATA MMAMIL), MMAMIZ) / AHILOG, AHZSUM/
                                                                                                                                                                                                                                            CALL FDSDRT (FT (1,M), ITAG, DIS, JB)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CALL FDSORT (FT(1,N), ITAC.DIS.JD)
                                          SUBROUTINE FICKIFT, JOX, IEOJ)
                                                                                                                                                                     IF(ISW.EQ.12345) GOTO 28
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                IF (N.LT. B. OR. N. GT. 3) N=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          5-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ELSE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           66
                                                                                                                 DIKENSION NTAC(58)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             IF (N. EQ. 3) GOTO 25
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  IF (N.EQ. 6) 60TO 31
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          END OF TRYOUT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                READ (INPF.986) N
                                                                                                                                                                                                                                                                                                                                                                                                                                            WRITE (10UTF, 985)
                                                                                                                                    DATA IHY/IHY/
                                                                                                                                                                                                                            DO 18 N=1,2
                                                                                                                                                                                          ISN=12345
                                                                                                                                                                                                                                                                                                                                                                                                           CORKATOLL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CONTINUE
                                                                                                                                                                                                                                                                                                                                      CONTINUE
                                                                                                                                                                                                                                                                                                                                                                        CONTINUE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         6010 58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           6010 50
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1E0J=2
```

RETURN

78668=C+++ 78768= 25

USER RESET OF SUBSPACE TACS LIST

71696=C++

-8266 -86969 \$9766=C+++ \*\*\*3=0956

\$9368=C### 59918=C+++ +++-7=2266° 1993Ø=C+++

-9000 78188= -89781 18388= =9618 18580=

69488= 985

69188= 28 3568= 8826

##3=8986

186 -88188

-68989

8288=C++

57168= 77289= -96639 -99189 -88388g 56488= -89289 91 -93687

588882

```
FORMAT(ZX.9H SUBSET ,13,/ZX,8H ZAFS= ,(((26(1X12) ))) ) IF(ICLX,LT,8) GOTO 46
                                                                                                                                                                                                       REINITIALIZE CLAS FILE BEFORE SUBSET
                                                                                                 REBO(INF,9%1) (LISD(K), K-KK,KN)
IF (ILOD.EQ.1) WRITE(ILOGF,9%2)
IF (ILOD.EQ.1) WRITE(ILOGF,9%7) (LISD(K), K-KK,KN)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ZAP' UNSPECIFIED DIMS IF ICLX > 4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TAP! SPECIFIED DINS IF ICLX < 8
                                                                                                                                                                                                                                                                                                                                                 DECODE SUBSET CONTROLS
INPUT DIMENSIONS LIST
                                                                                                                                                                                                                                                           CALL LDADC(CLAS, JDX, ICX, IEDJ)
CALL INDEX(CLAS, JDX, ICX, IEDJ)
                                                                                                                                                                                                                                                                                                                                                                                                IF (LISD (KK) . CE. 99) COTO 30
                                                                                                                                                                                                                                                                                                                                                                                                                  IFILISDIKKY, EQ. 6) COTO S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CALL ERR (10UTF, NM, 1EOJ)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CALL IASORT (LISD, KK-1)
                                                                                                                                                    FORMAT (2H+ , 28 (12, 1X))
                                                 FORMATCIZH DD.DD. ...
                                                                                                                                                                                                                                                                                                              IF (IEOJ.CT.@) GOTO 808
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    IFIKN.LT.50) 60TO 5.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       IF (IEDJ.LT.8) 60TO 5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ERROR RETRY
                                                                                   IF (KN. CT. 58) KN=58
                                                                                                                                                                       FURNAT (28 (12, 1X))
                               WRITE (IOUTF, 982)
                                                                                                                                                                                                                                          BACKSPACE 10LDC
                                                                                                                                                                                                                                                                                                                                                                                 DO 24 K=1,28
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         6010 388
                                                                                                                                                                                                                                                                                                                                                                                                                                                  CONTINUE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CONTINUE
                                                                    KN=19+KK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     G0T0 36
                                                                                                                                                                                                                          CONTINUE
                                                                                                                                                                                                                                                                                                                                                                CONTINUE
                                                                                                                                                                                                                                                                                                                              0000
                                                                                                                                                                                          6010 28
                                                                                                                                                                                                                                                                                               MZAPD=8
                                                                                                                                                                                                                                                                                                                                                                                                                                     KK=KK+1
                                                                                                                                                                                                       82189=C+**
82286= 8
82366=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               34688= 983
                                                                                                                                                                                                                                                                                                                                                82988=C###
82988= 28
                                                   1288= 982
                                                                                                                                                    81888= 987
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       83786=C++
83866= 25
$443=#B6B0
                                                                                                                                                                       81966= 981
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             94388=C+
                                                                                                                                                                                                                                                                                                                                                                                                                                                   33408= 24
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             $4500=C++
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               34488- 38
                 31966= 5
                                                                                                                                                                                                                                                                                                                                                                                               83188=
83288=
83388=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    83688=
                                                                31308=
                                                                                  81588:
81588:
81588:
81788:
                                                                                                                                                                                          =99973
                                                                                                                                                                                                                                                            =89178
                                                                                                                                                                                                                                                                            82558=
                                                                                                                                                                                                                                                                                                              82688=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      83208=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         83966=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          34888=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         -99148
                                                                                                                                                                                                                                                                                                                                                                                 33666=
                                                                                                                                                                                                                                                               +-81 TO 58 --> "ZAP" DIMENSIONS AS ABOVE FOR SPECIFIED CLA
                                                                                                                                                                                            88 --> QUIT SUBSET, CONTINUE JOB
64 --> QUIT SUBSET, END JOB
+98 --> "ZAP" ALL BUT SPECIFIED DIMS FOR ALL CLASSES
                                                                                                                                                                                                                                             -99 --> 'ZAP' SPECIFIED DIMENSIONS FOR ALL CLASSES
                                                                                                                                         DIMENSION CLAS(JDX,1),LISD(5B)
ACCEPTS USER INPUTS AND SUBSETS OR 'ZAPS' COMPONENTS
                                                    CONNON/NAMES/INPF, IOUTF, IFEAT, IOLDC, INEMC, ILOGF, IHISC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         FURNATION SUBSET/28H ENTER CLASS AND DIMENSIONS)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  IF (IABS(ICLX), GT.NTC. AND. IABS(ICLX), NE. 99) 6010 25
                                                                                       COMMON/CONX/LCID(S(,3),SCALE(2),ICONF,ANS(3),IMAG
                                                                                                                                                                                                                                                                                                  ## --> CONTINUE LIST FOR THIS CLASS

-> INDICATES DIMENSION TO NULLIFY

99 --> END LIST FOR THIS CLASS
                                                                                                                     CORNON/KFILE/MAXKV, NCIX, NENT, MSCAL, MZAPO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            INPUT CLASS/CONTROL VALUE
                                   SUBROUTINE SUBSET (CLAS, JDX, ICX, IEOJ)
                                                                                                                                                                           ICLX=98 --> INITIALIZE CLAS FILE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               IF (1LOG. EQ. 1) WRITE (1LOGF, 986) ICLX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FORMATILITH SUBSET CLASS= ,13)
                                                                      CONNON/TRACE/ILOG, ITRACE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               IF (ICLX.EQ.98) G0T0 8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  IF (ICLX.EQ.6) GOTO 888
                                                                                                         CORNON/CHUM/NEXC,NTC
                                                                                                                                                                                                                                                                                   LISD=(# --> ERROR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             FORMAT (SH +CL/2H +)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           READ (INFF, 985) ICLX
                                                                                                                                                                                                                                                                                                                                                                                                                                                         WITE(100TF, 988)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              WRITE (10UTF, 984)
                                                                                                                                                                                                                                                                                                                                                                                                       DO 2 L=1,59
                                                                                                                                                                                                                                                                                                                                                                                                                    FISD(F)=@
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                FORMAT (13)
                                                                                                                                                                                                                                                                                                                                                                                       5-X07-00
                                                                                                                                                                                                                                                                                                                                                     CONTINUE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CONTINUE
                                                                                                                                                                                                                                                                                                                                                                                                                                          1507=-1
                                                                                                                                                                                                                                                                                                                                                                       NN=3
                                                                                                                                         77688=
                                                                                                                                                                                                                                                78266=C+++
78389=C+++
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            88188= 965
                                                                                                                                                                           77888=C+++
                                                                                                                                                                                              77968=C+++
                                                                                                                                                                                                              78606=0+++
                                                                                                                                                                                                                              78166=C+++
                                                                                                                                                                                                                                                                                   18466=C+++
                                                                                                                                                                                                                                                                                                ***7:9858
                                                                                                                                                                                                                                                                                                                   $6893-C+++
                                                                                                                                                                                                                                                                                                                                     8769=0+++
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          956= 985
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        9688=C+++
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1968= 9966
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             8388- 986
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           9788= 3
                                                                                                                                                                                                                                                                                                                                                    1 =8558
                                                                                                                                                                                                                                                                                                                                                                                                                       3798= 2
                                                   7238=
                                                                                       -8852
                                                                                                      7588=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             -54938
                                                                                                                                                                                                                                                                                                                                                                                     ×8006
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           =8886
                                                                                                                                                                                                                                                                                                                                                                                                       9166=
                                                                                                                                                                                                                                                                                                                                                                                                                                         -9386
                                                                                                                                                                                                                                                                                                                                                                                                                                                          -88%
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               88788=
88588=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 - 88688
- 88788
- 88888
```

```
CONTINUE
IF (ILGC.EQ.3)#RITE(ILGGF,903)ICLX,(LISD(J),J=1,JD)
#ZAPD=1
                                                                                                                                                                                                                                                                                                                                                        CLEAR LISD WHEN LISD HAS AN ENTRY
COMPLEMENT LISD IF ICLX = +99
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         'ZAP' CLASSES AND DIMENSIONS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               IF(ILOG.EG.1.OR.ILOG.EG.2)
1 CALL PRCLAS(CLAS,CLAS,CLAS,JDX,ICX)
RETURN
END
                                                                                                                                                                                           IF (LISD (KN), EQ.JN) GOTO 37
SET LISD WHEN LISD NOT SET
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 IF (NCSDR. GT. Ø) CLAS (JZAP, NCSDR) = 1E28
CONTINUE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 IF(IAES(ICLX).NE.99) COTO 888
IF(NCL.GE.NTC) COTO 888
NCL=NCL+1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        IF (IABS (ICLX).NE.99) NCL=ICLX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     QUIT JOB EXIT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NCSDR=LCID(NCL,3)
DO 50 J=1,JD
IF(LISD(J).E9.0) GOTO 50
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NORMAL EXIT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CLAS (JZAP, NCSDL) =1E2#
                                                                                                                                                             IF (JN.EQ. 6) COTO 48
                                                                                                                                                                                                                                                                                                                                                                                                                                                             JN=JN-1
IF (KN.6T.1) KN=KN-1
G0T0 35
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CONTINUE
NCSDL=LCID(NCL,2)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         JZAP=LISD(J)
                                                                                                                                                                                                                                                             LISD(JN)=JN
                                                                                                LISB(KK)=
                                                                                                                                                                                                                                                                                                                                                                                                                          FISD(JN)=0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CONTINUE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CONTINUE
                                CONTINUE
KN=KK-1
                                                                                                                                                                                                                                                                                                                                                                                            CONTINUE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   S8SSS= SSS CONTINUE
                                                                                                                                                                                                                                                                                                                            COTO 35
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      COTO 45
                                                                                                                                                                                                                                                                                                   1-N-N-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       IE0J=2
                                                                                                                                   97=N5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NCL=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           85758=
85758=
85568=
87868=
87158=
87158=
87158=
87158=
87158=
87158=
87158=
87158=
87158=
87158=
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86288=
86388=
86489=
86588=C***
                                                                 85888=
85188=
85288=
85388= 35
34888=C+++
                                34988= 33
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       #+J=83688
```

```
1 CALL XSCAL(CLAS(1:NCMIN), CLAS(1:NCMAX), FEAT(1:L), JD, SCALE, 1)
                                                                                                                                         COMPUTE MAHALANOBIS' DISTANCE 2 WAYS
TO EACH PROTO! PICK CLOSEST CLASS
                                                                                                                                                                                                                                                                                                              COMPUTE MAHALANOBIS' DISTANCE 2 WAYS
                                                                                                                                                                                                                                                                                                                             TO EACH PROTO; PICK CLOSEST CLASS
               FMIN, FMAX ARE CLOBAL BOUNDS
SCALING IS DK-MAHDIS, NG EUCDIS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       IF (DFEAT.GE. 8.8.AND.KSYM.E9.2)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       IF (DIS(J). GT. DMAX) DMAX=DIS(J)
                                                                                                                                                                                                                                                                                                                                                                                                                                                        IF (DFEAT.LT.0.0.0R.KSYM.EQ.1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DIS(J) = DFEAT/CLAS(J,NCSDR)
                                                                                                                                                                                                                                                                                                                                                                                                                                          DFEAT=FEAT (J,L) -CLAS (J,NCAV)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DIS(J)=DFEAT/CLAS(J,NCSDL)
                                                                                                                                                                                                                                                                                                                                                                                                           REAL DISTANCE PROCESS
PROCESS FVEC BLOCK
                                                                                                                                                                                                                                                                                                                                                                                            IF (SCALE(1), CT.1.) 60T0 168
                                                                                                                                                                                                                                                                                                IF (NCSDR. GT. Ø) KSYM=2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DIS(J)=ABS(DIS(J))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DMAG=DNAC+DFEAT ** 2
                                                                                                                                                                                                                                     FNIC=CLAS(JD+3,NCAV)
                                                                                                        FVEC=FEAT (JDX-2,L)
                                                                           IF (SCALE(1), CT.1.)
                                                                                                                                                                                                                                                                                                                                                                            IF (N.EQ.NTC) ISX=2
                                                                                                                                                                                                                                                                                                                                                                                                                          DO 15g J=1,JD
                                                                                                                                                                                                                                                     NCSDL=LCID(N,2)
                                                                                                                                                                                                                                                                  NCSDR-LCID(N,3)
                                                                                                                                                                                                       DO 266 N=1,NTC
                                                                                                                                                                                                                      NCAV=LCID(N,1)
                                                                                                                                                                         DMIN= . 99E99
                                                                                                                           NUXV=NUXV+1
                                              CONTINUE
                                                                                                                                                                                                                                                                                   KSY#=1
                                                                                                                                                                                                                                                                                                                                               DNAC-0.
                                                                                                                                                                                                                                                                                                                                                               DYAX = 6.
                                                               1+1
                                              13466= 108
                                                                                                                                                       24188=C##
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   158
               3288=C++
                              23366=C++
23168=C++
                                                                                                                                        40000=C++
                                                                                                                                                                                                                                                                                                                                                                                                         25788=C**
                                                                                                                                                                                                                                                                                                                                52.88=C++
                                                                                                                                                                                                                                                                                                                5168-C++
                                                                          23788=
                                                                                                                                                                                                                                  24688=
                                                                                                        23888=
                                                                                                                                                                         -9975
                                                                                                                                                                                     4360=
                                                                                                                         23986=
                                                                                                                                                                                                     24466=
                                                                                                                                                                                                                                                                 4800=
                                                                                                                                                                                                                                                                                  -8865
                                                                                                                                                                                                                                                                                                                                               5388=
                                                                                                                                                                                                                                                                                                                                                            5488=
                                                                                                                                                                                                                                                                                                                                                                            25588=
                                                                                                                                                                                                                                                                                                                                                                                                                          25988=
25988=
                                                                                                                                                                                                                                                                                                                                                                                                                                                         =00097
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          26190=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      26288=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       =88897
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     =8019
                                                                                                                                                                                                   EGUIVALENCE (FNICANIC), (ICME, CME), (NVEC, FVEC), (IKNO, FIKNO)
EGUIVALENCE (IRATE (1, 1), RATE (1, 1))
                                                                                                                      COMMON/SRCH/ISX, IKNO, NIC, JD, ITAC (50), DIS (50), RATE (2, 50)
                            SUBROUTINE EVAL (FEAT, CLAS, CMX, JUX, NAX, IC, IEOJ)
COMMON/NAMES/INPF, 10UTF, IFEAT, IOLDC, INEMC, ILOGF, IHISC
                                                                      COMMON/CONX/LCID(51,3),SCALE(2),ICONF,ANS(3),INAG
COMMON/CREC/LASV,IEOFR,NBPR,LB,MAXV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  INPUT FEATURE VECTORS, COUNT PER CLASS
                                                                                                                                                    DIMENSION FEAT (JDX,1), CLAS (JDX,1), CMX (IC,1)
                                                                                                                                      COMMON/TRY/IFIG.ISUB:NT1:ND1:ND2:LABLC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CALL RFEAT (FEAT, JDX, INIT, IEOJ)
                                                                                                                                                                                                                                    EQUIVALENCE (PDIS(1),NTAC(1))
                                                                                                                                                                        DIMENSION PDIS(50),NTAC(50)
DIMENSION IRATE(2,50)
                                                              COMMON/TRACE/ILOG.ITRACE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  IF (IE0J.CT.8) COTO 868
                                                                                                            COMMON/CNUM/NEXC,NTC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  FIKNO=FEAT (JDX-1,1)
                                                                                                                                                                                                                                                                   NCMIN-LCID(51,1)
                                                                                                                                                                                                                                                                                 NCMAX=LCID(51,2)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    IKNO=IAES(IKNO)
                                                                                                                                                                                                                                                                                                                                                           DO 26 N=1,NAX
                                                                                                                                                                                                                                                                                                                                               JI 1=1 10 00
                                                                                                                                                                                                                                                                                                                                                                            CMX(I,N)=6.8
                                                                                                                                                                                                                                                                                                                                                                                                                          DO 38 K=1,3
                                                                                                                                                                                                                                                                                                                                                                                                                                         ANS (K) = 8.8
                                                                                                                                                                                                                                                                                                                                                                                                        CONTINUE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CONTINUE
                                                                                                                                                                                                                                                                                                                                                                                             CONTINUE
                                                                                                                                                                                                                                                                                                JD=JDX-3
                                                                                                                                                                                                                                                                                                                             E03=-1
                                                                                                                                                                                                                                                                                                                B=1INI
                                                                                                                                                                                                                                                                                                                                                                                                                                                         8=NKON
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NUNT=8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NEXC=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      22408=0+4
                                                                                                                                                                                                                                                                                                                                                                            21686= 28
                                                                                                                                                                                                                                                                                                                                                                                                         21866= 25
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     2508= 58
                                                                                                                                                                                                                                                                                                                                                                                                                                          22668= 38
                                                                                                                                                                                                                                                     ##J=00897
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                                                                                                                                                                                                                                                                    -88687
                                                                                                                                                                                                                                                                                   -8381
                                                                                                                                                                                                                                                                                               1166=
                                                                                                           19968=
```

KFEAT = (FEAT (J,L) -CLAS (J,NCAV)) SCALED DISTANCE PROCESS IF (DIS(J), GT. DNAX) DNAX = DIS(J) IF (NFEAT. GE. B. AND. KSYM. EQ. 2) IF (KFEAT.LT. B.OR.KSYN.EQ.1) RESUME DECISION RULE KCSDL=CLAS(J,NCSDL)+2. KCSDR=CLAS(J,NCSDR)+2. FIDVAL. GT. DMIN) GOTO 288 DISLUI=NFEAT/NCSDL DIS(J)=KFEAT/KCSDR KFEAT - KFEAT#2##8 IF (IFIG.EQ. 1) CALL LOOK FINAC.EQ. 1) DVAL = DNAC DIS(J) =4BS(DIS(J)) CHOSE CLASS OC 11=C 881 00 DMAG=SURT (DMAG) PDIS (N) = DVAL CONTINUE DVAL = DMAX DAIN-DUAL GOTO 198 SAY=NIC CONTINUE CONTINUE 15X=1 17689= 168 26988= 26988=C## 187 - 188787 961 =82587 78483= 188 1836g=C## #13=8588; 27686= 27786= 27586= 27586= 28886= 28186= 27468= -86272 27368= 27566= 289682 .828g= 28668z 2876B= 29068= 29168= 29268= 29388= 27169=

FORMAT (2X,7HDEC VEC.15.6H CLASS.14.4H IS .14/(((10(1XE9.3) ))) )

38288= 988

38368=

185 -98588

38788=C\*\*

I WRITE(ILUGE, 988) NVEC, IKNO, ISAY, (PDIS(N), N=1,NTC)

STORE FVEC RECOGNITION DECISION CMX(IKNO, ISAY) = CMX(IKNO, ISAY) +1.

IF (IKNO.NE.ISAY) ANS (1) = ANS (1) +1.
IF (IKNO.NE.ISAY) ANS (2) = ANS (2) +1.

=80867

IF(ILOG.EQ.1.AND.L.LT.5)

IF (L.LT.S.AND. (ICOG.EQ.1.07.ILOG.ED.2))

1 WRITE (ILOGF.9G1) INVO.NUMV. (FEHT(J.L).J=1.JD)
FORMAT(GH CLAS= ,13.14H FEAT VEC NO= ,14/(((10(1XE9.3)))) )
IF (L.LT.LASV) COTO 100

FINISHED A PRIORI CLASS

38988=C++

=88888

GET NEXT RECORD BLOCK

IF (IEOFR.NE.1) 6070 50

IRATE(1.J)=RATE(1.J)/FLOAT(NUMT)\*108. IRATE(2.J)=RATE(2.J)/FLOAT(NUMT)\*108. UNITIZE CONFUSION MATRIX ICHE= (CHX(I,N)/CMX(I,NAX)) +188. FINISHED ALL FEAT FILE ANS (J) = ANS (J) /FLOAT (NUMT) IF (NEXC.LE.IC) 60TO 50 FORMAT (SH EV , 1116) ERROR EXIT CHX (INNO, NAX) = NUNY DO 688 N=1,NTC DO 588 I=1,IC NUNT-NUNT+NUNV DO 75# J=1, JB DO 766 J=1,3 CMX (I,N) = CKE KEXC=NEXC+1 CONTINUE CONTINUE CONTINUE CONTINUE RETURN IEOJ=# NUXV=6 32788= 788 32888= 32888= 33888= 33308= 866 31006= 396 31400= 957 11988= 488 32430= 266 32500= 666 33188= 758 31868=0++ 33788=0+4 31768=C++ 31566= 31690= =889728 31166= 31266= 32188= 32268= 32000=

```
CALCULATES ERROR CLASSIFICATION RATES FOR THE JD
SUBSETS OF THE JD DIMENSIONS OF FEATURE SPACE.
THESE SUBSETS ARE THE JD SETS OF INCREASING NUMBERS
OF COMPONENTS ORDERED BY DECREASING PIGURES OF MERIT?.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     COMPUTE AN R-INFINITY MAG FOR EACH SUBSET VECTOR
                     COMMON/SRCH/ISX.IKNO.NIC.JD.ITAC(SØ).DIS(SØ).RATE(2,SØ)
DIMENSION CLOSE(SØ).IPICK(SØ)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             HAVING CHECKED ALL CLASSES, RECORD DECISION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                IF (TMAG. GT. CLOSE (J)) GOTO 95
SAVE TENTATIVE DECISION FOR EACH SUBSPACE
                                                                                                                                                                                                                                                                                                                                               REDRIDER DISTANCE VECTOR PER MERIT TAGS
                                                                                                                                                                                                                                  RESET CLOSE AND IPICK DECISION ARRAYS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            IF(IPICK(J).EG.IKNO)RATE(1,J)=RATE(1,J)+1.8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     IF (IPICK(J).NE.IKNO) RATE (2, J) = RATE (2, J) +1.6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      IF (NORK (K) . CE. THAG) THAG=NORK (K)
COMMON/TRACE/ILOG, ITRACE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     IF (15%, NE. 2) COTO 100
                                                                                                                                                                                                                IF (15%, NE. 6) COTO 48
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NORMAL EXIT
                                                              DIMENSION WORK (58)
                                                                                                                                                                                                                                                                                                                                                                                                                              WORK (J) = DIS(K)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           OC 168 J=1, JD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CLOSE (J) = TMAG
                                                                                                                                                                                                                                                         DO 26 I=1,JD
                                                                                                                                                                                                                                                                           CL05E(T)=1E9
                                                                                                                                                                                                                                                                                                                                                                                     00 45 J=1,JD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           IPICK(J) =NIC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DO 98 K=1.J
                                                                                                                                                                                                                                                                                                  IPICK(I)=6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TMAG=-1E2@
                                                                                                                                                                                                                                                                                                                                                                                                          K=1TAG(J)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CONTINUE
                                                                                                                                                                                                                                                                                                                         CONTINUE
                                                                                                                                                                                                                                                                                                                                                                 CONTINUE
                                                                                                                                                                                                                                                                                                                                                                                                                                                 CONTINUE
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            62169= 168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     82338= 898
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               161266=C++
                                                                                                                                                                    99288=C++
                                                                                                                                                                                                                                  ##J=89566
                                                                                                                                                                                                                                                                                                                                                                 68168= 46
                                                                                     98888-C++
                                                                                                       $850@=C##
                                                                                                                              ##3=80066
                                                                                                                                                                                           $9368=C##
                                                                                                                                                                                                                                                                                                                      86968= 26
                                                                                                                                                                                                                                                                                                                                            ##J=866691
                                                                                                                                                                                                                                                                                                                                                                                                                                                 86568= 45
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             81160= 98
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 81660= 95
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ##3=@##B18191
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              02266=C++
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     $8660B=C++
                                         -88988
                                                                                                                                                                                                                =80166
                                                                                                                                                                                                                                                           =80966
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          161498=
                                                                =00/86
                                                                                                                                                                                                                                                                               =00769
                                                                                                                                                                                                                                                                                                  =00866
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -86869 I
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    =896881
                                                                                                                                                                                                                                                                                                                                                                                                                            166459=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -99619
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -200361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           =63/66
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         161600=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               -605191
                                                                                                                                                                                                                                                                                                                                                                                                          -8030891
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     IF(ILOG.NE.B)WRITE(ILOGF.983) (J.IRATE(1,J),IRATE(2,J),J=1,JD)
                                                                                COMMON/CONX/LCID(51,3),SCALE(2),ICONF,ANS(3),IMAC
COMMON/SNCH/ISX,INNO,NIC,UD,ITAC(59),DIS(59),RATE(2,59)
                                     COMMON/NAMES/INFF.IOUTF.IFEAT.IOLDC.INEWC.ILOGF.IHISC
COMMON/TRACE/ILOG.ITRACE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  IF (ILDG.NE. 8) WRITE (ILDGF, 981) NUM, I, (CMX (I,N), N=1,NTC)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              WRITE(IQUIF,983) (J,IRATE(1,J),IRATE(2,J),J=1,JB)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        IF (ILOG.NE.8) WRITE (ILOGF, 984) (ITAC(J), J=1, JB)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         FORMAT(15H SUBSPACE TACS/(((26(1X,12))) ) )
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PRINT SUBSPACE ERROR RATES IF OPTED
                                                                                                                                                                                                                                                                        [F(ILOG.NE.8) WRITE(ILOGF, 962) (ANS(I), I=1,3)
                                                                                                                        COMMON/TRY/IFIG, ISUB:NTI, NDI, NDZ, LABLC INTEGER CLAS(JDX,1), CMX(IC,1)
                                                                                                                                                                                                                                                                                          FORMATIZEH SUNMARY CONCLUSION/3F7.4)
   SUBROUTINE DOCU(CNX,CLAS, JDX,NAX,IC)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              FORMAT(22H SUBSPACE ERROR RATES/
1 (((12(1X,12,1H=,12,1H/,12))))
                                                                                                                                                                                                      EQUIVALENCE (IRATE (1,1), RATE (1,1))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              #RITE(10UTF,984)(11AC(J),J=1,JD)
                                                                                                                                                                                                                                                                                                                                                     IF(ICONF.LT.1) GOTO 20
PRINT CONFUSION MATRIX
                                                                                                                                                                                                                                                    WRITE(10UTF,982) (ANS(I),I=1,3)
                                                                                                                                                                                                                                                                                                                FORMAT(2X,14,13,(((37(13)))))
                                                                                                                                                                                                                                                                                                                                       FORMAT (18H CONFUSION MATRIX)
                                                                                                                                                                                                                                                                                                                                                                                                  IF (ILOC. NE. 8) WRITE (ILOCF, 983)
                                                                                                                                                                                                                               PRINT CONCLUSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     IF (IFIG.NE.1) GOTO 38
                                                                                                                                                                 DIMENSION IRATE(2,50)
                                                                                                                                                                                    EQUIVALENCE (FRUM, NUM)
                       COMPON/CNUM/NEXC,NTC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NORMAL EXIT
                                                                                                                                                                                                                                                                                                                                                                                                                      DO 16 I=1,IC
NUM-CMX(I,NAX)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CONTINUE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                NUN-FAUN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CONTINUE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     RETURN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         37188= 984
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 37200= 983
                                                                                                                                                                                                                                                                                          35388= 962
                                                                                                                                                                                                                                                                                                              35488= 981
                                                                                                                                                                                                                                                                                                                                     35588= 988
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                37588= 38
                                                                                                                                                                                                                               34988=C++
                                                                                                                                                                                                                                                                                                                                                                              35788=C##
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      91 =88598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 36598= 28
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           37488=C##
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             36468=C+
                                                                                                                                                                                                                                                                                                                                                         32688=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       37389=
                                                                                                                                          34588=
                                                                                                                                                                                                          34898=
                                                                                                                                                                                                                                                    35183=
                                                                                                                                                                                                                                                                        35288=
                                                                                                                                                                                                                                                                                                                                                                                                   35888=
                                                                                                                                                                                                                                                                                                                                                                                                                                         36688=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    36283=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      36688=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        36788=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              36898=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 36988=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       37998=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     37683=
                                                                                                       34388=
                                                                                                                                                                 34688=
                                                                                                                                                                                    34783=
                                                                                                                                                                                                                                                                                                                                                                                                                       35988=
                                                                                                                                                                                                                                                                                                                                                                                                                                                               36183=
```

RETURN

-03470

APPENDIX H
FORMAT Module

IFITEOJ.EG.18) WRITE(IOUTF.985) FORMAT(39H CLAS FILE HAS INCONSISTENT DIMENSIONS) IF(IFN.EQ.3) WRITE(IOUTF.950) NDSENT FORMAT(14H XMIT OUTFUT ,13,11H DIMENSIONS) FORMAT(27H CLAS AND FEAT NOT MATCHED) FORMAT (2X, 28H TOO LITTLE MEMORY FORMATIZX, 18H MISSING RECORD IF (IEQJ.EQ.S) WRITE (IOUTF, 984) IF(IEOJ.EQ.4) WRITE(IOUTF,983) IF (IEOJ.EQ.2) WRITE (IOUTF, 901) FORMAT(18H ILLEGAL FUNCTION) IF (IEOJ.EQ.1)WRITE(IOUTF,900) IF (IEOJ.EQ.6)WRITE(IOUTF,996) IF (IEOJ. EQ. 3) WRITE (IOUTF, 962) FORMATICX, 13H WRONG FILE PRINT ERROR MESSAGES FORMAT (15H ILLEGAL INPUT) NORMAL END OF JOB MEB= 780 CONTINUE CONTINUE 3888=C\*\*\*\*\*\*\* 3988= 888 CONT 308=C\*\*\*\* 3688= 958 4100= 900 4200= 4988= 984 5888= 5188= 985 5288= 5388= 986 5488= 5588= 5688= 4588= 982 4768= 983 4366= 981 3768= =999 4888= CALL XFEAT(WO(NLI), WO(NBI), WO(NXI), WO(NCI), JDX, NBX, IEOJ) COMMON/NAMES/INPF, IOUTF, IFEAT, IOLDC, INEWC, ILOGF, IHISC 3 CALL XHIST(WG(NL1), WG(NB1), WG(NX1), NHX, NBX, IEGJ) IF (IEGJ, EQ. -9) GOTO 700 Z CALL XCLAS(WO(NCI), WO(NBI), WO(NXI), JDX, NBX, IEOJ) COMMON/PARAM/MEMC.MEM.NHX, JDX, ICX, NC1, NL1, NB1, IC PROCRAM FORMAT (FEAT, OLDC, HIST, BITE, LOCF=64, COMMON/FORM/IFIL, IFN, IGRIN, WBX, NBY, NDSENT CALL LOADC(WO(NCI),JDX,ICX,IEOJ)
CALL INDEX(WO(NCI),JDX,ICX,IEOJ) 1 INPUT=64,0UTPUT=64) 38 OCT VERSION 1488 IF (NEXC.LE.NTC) COTO 18 PROCESS EACH CLASS IF (IE0J.CT.8) COTO 868 IF (IEQ., GT. 8) GOTO 866 IF (IE0J.CT.Ø) COTO 828 IF (IE0J.CT.8)C0T0 788 COMMON/CNUM/NEXC: NTC CALL NEXREC(IEDJ) CALL DEFF (IEOJ) CONMON WO (8288) IF (IFIL.GE.3) IF(IFIL.EQ.1) IF (IFIL, Eq. 2) DO 5 N=1,NEM CONTINUE MEN-8288 10 (M) = 0. CONTINUE NX1=1 2888=C+++++ 2188= 18 1488= 5 1666= -561 =836 1108= 1366= 1588= 1868= 1968= 2288= 2388= 2400= -8822 =839

F (ILOG.NE. B) WRITE (ITRACE, 957) IFIL, IFN, ILOG, NEXC, NTC, NCI, NBI, NLI MEMC, MEMF, MEMH --->CLAS, FEAT, HIST BUFFERS MEMX-->3DPLOT(HID), MEMB-->PLOT BUFFER BUFFER(NEX,NBY) MEMORY REQUIREMENTS MEMORY CONTROL PARAMETERS HBUF(NBUC,JD), CBUF(JD,ICX), FBUF(JD,LS) STRIP-->NBY,LE,9 ,PLOT-->NBY,LE,58 CHECK THAT MEM IS BIG ENOUGH MENK=NEM-MENL-NENC-NEMB-NEMX IF (IFN.EQ.2) NEY=MING (NEY, 58 F(IFN, GE. 3) NBY=MING(NBY, 0) IF (IFN, EQ. 1) NBY=MING (NBY, 9) IF (IFIL.EQ.1) MEML=JDX\*LB TOO LITTLE MEMORY INPUT ERROR EXIT IF (IFIL. CE.3) MEML=NHX+JD CALL ERRITOUTF, NW, IEDJ) IF (IFIL, GE, 3) NBX=NHX-8 IF (IFIL, EQ. 2) NBY=5\*ICX IF (IE0J.CT.0) GOTO 20 IF (MEMK.LT.8) GOTO 25 IF (IE0J.LT.#) GOTO 5 NORMAL EXIT FORMAT(6H DEFF ,814) ERROR RETRY IF (IFIL.LE.2) NBX=JD IF (IFIL.EQ. 1) NBY=LB IF (IFIL.EQ. 1) NTC=IC IF (IFIL.GE.3) NBY=JD IF (IFN, EQ. 3) NBX=1 MEMX=2\* (NEX+NBY) MEMC=JDX\*ICX MENB=NBX+NBY VB1=NCI+MEMC NL1=NB1+MEMB NCI=1+HENX CONTINUE CONTINUE CONTINUE CONTINUE G0T0 22 COTO 20 1E03=0 RETURN E07=3 22438=844 22558-0\*\*\* 25000=0+++ 25368=C++ 25466= 25 22153=0+++ 22288=0+++ 22388=044 24828= 957 22888=0\*\*\* 24488=C\*\* 24788=0++ 24808= 20 25188= 22 25888= 38 25768=0## 24200= 22786= 22866= 23866= 23166= 23366= 23366= 23568= 23668= 23868= -28662 24696= 24300= 24500= 24600= 24818= 25268= 25688= 23488= 25566= 25988= 26166= =88897 T--> TRACE EXECUTION Y--> TRACE AND LOG L--> LOC OUTPUT FORMATISH FORMAT/25H ENTER FILE AND FUNCTION/2H +) GET SPECIAL PLOT PARAMETERS CET SPECIAL XMIT PARAMETERS IF (1LOG. NE. 8) WRITE (1LOGF, 984) ICPS, ICRIN CALL OPENX (Ø. IFIL+1, LABLC, LABLF, IEOJ)
IF (IFIL. GT. 2) CALL OPENH (LABLH, IEOJ) P-->PICTURE (3D) S-->STRIP CHART IF (ILOG, NE. 8) WRITE (ILOGF, 962) KOPNS FORMAT (23H ENTER XMIT PARAMETERS/ FORMAT (23H ENTER PLOT PARAMETERS) IF (ILOG.NE. 0) WRITE (ILOGF, 980) IF (1LOG.NE. B) WRITE (1LOCF, 986) IF (ILOG.NE.8) WRITE (ILOGF, 983) IF (MSCAL, NE. 1) SCALE (1) = 256. IF (KOPNS(I) .EQ. IHD) IFIL=4 IF (KOPNS(1), EQ. IHC) IFIL-2 IF (KOPNS (1) .EQ. THH) IF IL =3 IF (KOPNS(1).EQ. 1HY) 1LOG=2 IF (KOPNS(I).EQ.IHF) IFIL=1 IF (KOPNS(1), EQ. IHT) 1LOC=1 IF (KOPNS(1).EQ. IHL) 1LOG=3 IF (KOPNS(1), EQ. 1HX) IFN=3 IF (KOPNS(I), EQ. IHS) IFN=1 IF (KOPNS(I) . EQ. IHP) IFN=2 READ (INPF, 984) ICPS, IGRIN IF (ITEM.EQ. 8) GOTO 38 READ(INPF,981) KOPNS IF (IFN. NE. 21 GOTO 7 IF(1FN.NE.3) GOTO 9 READ (INPF.907) LADR OPEN DATA FILES 1 8H ICPS, 6/2H +) WRITE (IOUTF, 988) FORMAT (14,1X,A1) WRITE (10UTF, 986) WRITE (10UTF, 983) 6H AAAA/2H +) C-->CLAS, D-->DIST, H->HIST. FORMAT (2X, 3A1) TEM=IFIL+IFN FORMAT (3A1) FORMAT (4A1) DO 6 I=1,3 CONTINUE CONTINUE CONTINUE 17988= 981 9788= 983 7768= 982 18688= 984 21888= 987 7388= 988 986 =8888 \*\*\*3=8889 \*\*\*3=9269 8368=C+++ 8460=C### 7 =8828: 1366=C++ 7186= 5 9 =9836 7680=C# 6 =0821 7500= -28197 -02662 1468= 17688= -9598 18188= 18288= 18388= 8480= -6828 -6828 =8098 =0018 -80381 -80381 -9916 -8026 -9006 9536= -9096 -2236 =0266 -6253 .0200= -86982 =82187 21199=

X-->TRANSMIT AND FUNCTION

F-->FEAT,

6783=C+++

6668=C##

CET FILE

24.184=		48788=C+++	FINSH PATE FILE AT END
26589=	SUBROUTINE XCLAS(CLAS, BUF, HID, JDX, NBX, IEOJ)	30300= 20	CONTINUE
26688=	COMMON/NAMES/INPF, IOUTF, IFEAT, IOLDC, INEWC, ILOGF, IHISC	38988=	NVAL=16
=29897	COMMON/TRACE/ILOG,ITRACE	31186=	CHCL ANTI
26986=	COMMON/CONY/LCID(51,3),SCALE(2),ICONF,ANS(3),IMAC	31200=	NVAL=16
27666=	COMMON/FORM/IFIL, IFN, IGRIM, DUM, NEY, NDSENT	31360=	CALL XMIT
27798=	DIMENSION CLASSICIATION (NEXT), BUT (NEXT), 1912(1)	31599=0+++	THE THE CLEAN CHAIN CLEAR PARTY PAINT
273@8=C+++	INITIALIZE ON FIRST ENTRY	31688= 166	CONTINUE
27472=	.123	31769=	IF (IFN.EQ.2.AND.NPV.EQ.1) NPV=2
27563=	KIN-12345	31800=	IF (NEXC.CT.NTC) GOTO 199
27639=	KEY=NBY-5	31980=	DO 11g J=1,JD
27769=	NVAL=8	32668=	BUF (J, NFV+1) = CLAS (J, NCAV) - CLAS (J, NCSDL)
-99017	NFV=1 ID= 10X=2	=88175	BUF (J,NPV)=CLAS (J,NCAV)
28868=	1.503=1	32388= 118	DOCTOR VEL = CLAS (O) NCAV (O) NCSU)
28169=	LTIP=1	32400=	NPC=NPC+5
28235=C+++	PROCESS NEXT VECTOR (NPV)	32588=	IF (NPV. LE. KBY) COTO 833
28388= 18	CONTINUE	32686=C***	FLUSH BUFFER WHEN FULL
=99482	NDSENT=KDSENT	32766= 196	CONTINUE
28508=	NCAV=LCID(NEXC,1)	32886=	IF (IFN. EG. 2) CALL PICT (EUF, HID, NBX, NPV)
28688=	NCSDL=LCID(NEXC,2)	32988=	IF (IFN, EQ. 3) CALL STRIP (BUF, NBX, NPV)
28789=	NCSDR=LCID(NEXC,3)	33888=	NPV=1
28888=	NCSD=NCSDR	33160=C+*+	NORMAL EXIT
-20182	IF (NESDR.LT. @) NESD=NESDL	33200= 800	CONTINUE
29888=	IF(IFN.NE.3) 60T0 188	33386=	IF (NDSENT.EQ.8) COTO 818
29188=C+++	TRANSMIT PROTOTYPE VALUES	33468=	IF (NDSENT.NE.KDSENT) IEOJ=10
29268=C+++	SKIP 'ZAPPED' COMPONENTS	33286= 816	CONTINUE
29388=	IF (NEXC.CT.NTC) GOTO 20	33666=	RETURN
29468=	KDSENT=8	33766=	END
=80067	IVHL=NEXC		
=88967	10 12 J=11JB		
-00167	IT CCLASCOTACOBE, ST. LEGY GOLD 12 KROCKYT-KROCKYT-1		
-38662	IVAL = CLAS (J. NCAV)		
38666=	CALL XMIT		
38108=	IVAL=CLAS(J.NCSDL)		
=89292	IVAL-CLASIJ·NCSD)		
38488=	CALL XNIT		
36566= 12	CONTINUE		
38688=	COID SEB		

0

SUBROUTINE XXIST (HIST, BUF, HID, NHX, NBX, IEOJ)
CORMON/CNUM / MEXC, NIC
CORMON/FORM/1FIL, 1FN, 1CRIN, BUM, NBY, NDSENT
COMMON/HREC/ISTM, KTR, LABLH, NI, NDUC, JD
DINENSION HIST (NHX, 1), BUF (NBX, 1), HID(1)
PROCESS HISTOGRAMS FROM CREATE AND DEFINE D0 15 1=1.1SYM CALL FILBUF (HIST.BUF.NHX.JI.JN.KX.NY.ICON) IF(IFN.EQ.IFN) STOP "TEST" IF(IFN.EQ.2) CALL PICT(BUF.HID.KX.NY) IF(IFN.EQ.3) CALL STRIP(BUF.KX.NY) CALL RHIST(HIST,NHX,IEOJ)
IF(IEDJ.ED.-9) COTO 85
IF(IEDJ.CT.8) COTO 85
IF(IFN.EQ.1) GOTO 86
IF(ISTN.EQ.1) NX=NBUC
IF(ISTN.EQ.2) NX=NBUC J1=JN+1 JN=JN+3Ø IF(JN,CT,NBY) JN=NBY GOTO 10 NORMAL EXIT ERROR EXIT IF (IFIL.EQ.4)NEXC=99 RETURN END IF (JN.CE.JD) GOTO 28 IF (JN. GT. NBY) JN=NBY ICON=ISYM+1 ICON=1SYM CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE COTO 85 IEDJ=0 IE0J=5 UN=XN מר=אר 1=16 5788= 5888= 5988= 6888= 6188= 6289= 6388=C\*\*\* 9468= 85 9588= 85 9588= 9788= 9166=C\*\*\* 6785= 6885= 7885= 7186= 7186= 7186= 7186= 7186= 7186= 7186= 8860= 8180= 8180= 8180= 8180= 8180= 8180= 8180= 8180= 8180= 8988= 28 6588= 5 -9986 6466= -0006 -9999 8488= 8588= 8788= 8388=

```
CALL XSCAL (CLAS(1,NCMIN), CLAS(1,NCMAX), FEAT(1,L), JD, SCALE, 1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            FLUSH BYTE FILE AT END JOB
             IF (IFN.EQ.2) CALL PICT(BUF, HID, NBX, NPV)
IF (IFN.EQ.1) CALL STRIP (BUF, NBX, NPV)
                                                                                                                                                                                                                                SKIP 'ZAPPED' COMPONENTS
                                                                                    TRANSMIT FEAT VECTOR
                                                                                                                                                                                                                                                                                                                                               IF (CLAS (1, NCSD) . GT. 1E6) 60TO 68
                                                                                                                                                                                                                                                                                                                                                                                                                                      END OF RECORD
                                                                                                              IF(NEXC.GT.NTC) GOTO 200
IF(IEDJ.EQ.-9) GOTO 200
                                                      IF (IE0J.LT.8) GOTO 898
                                                                                                                                         IF (IEOJ.ED.-5) COTO 800
IF (L.NE.NUMV) COTO 90
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NORMAL EXIT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ERROR EXIT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 F(IEOFR.EQ. 0) COTO 5
                                                                                                                                                                     FIKNO-FEAT (JDX-1,U)
                                                                                                                                                                                                 FVEC=FEAT (JDX-2,L)
                                                                                                                                                                                                                 NVEC-MOD (NVEC, 255)
                                                                                                                                                                                     IKNO=IABS(IKNO)
                                                                                                                                                                                                                                                                                                                                                             KDSENT=KDSENT+1
                                                                                                                                                                                                                                                                                                                                                                            IVAL = FEAT (J,L)
                                                                                                                                                                                                                                                                                                                                  OC 11-1 97 00
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NDSENT=KDSENT
                                                                                                                                                                                                                                                           IVAL=IKND
                                                                                                                                                                                                                                                                          CALL XMIT
                                                                                                                                                                                                                                                                                        VAL-NVEC
                                                                                                                                                                                                                                                                                                      CALL XMIT
CONTINUE
                                                                    50TO 9Ø
                                                                                                 CONTINUE
                                                                                                                                                                                                                                                                                                                   KDSENT = @
                                                                                                                                                                                                                                                                                                                                                                                           CALL XMIT
                                                                                                                                                                                                                                                                                                                                                                                                       CONTINUE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CONTINUE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CALL XXIT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CALL XMIT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             COTO 888
                                                                                                                                                                                                                                                                                                                                                                                                                      CONTINUE
                                                                                                                                                                                                                                                                                                                                                                                                                                                  CONTINUE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CONTINUE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CONTINUE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          NVAL=16
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NVAL=16
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     LTYP=3
                                          NFV=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (E07=1
                                                    48788=
48588=
48588=C***
41888= 58
                                                                                                                                                                                                                            41960=C+++
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     44833=C***
44986= 888
                                                                                                                                                                                                                                                                                                                                                                                                       43266= 98
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        13888= 266
6366= 15
                                                                                                                                                                                                                                                                                                                                                                                                                                   43300=0***
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          $27@@=C***
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         14668= 858
                                                                                                                                                                                                                                                                                                                                                                                                                                                 13488= 95
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          4500=C***
                                         =2698
                                                                                                              11160=
                                                                                                                           41288=
41588=
41588=
41588=
41588=
                                                                                                                                                                                                 41700=
                                                                                                                                                                                                               41850=
                                                                                                                                                                                                                                            42668=
                                                                                                                                                                                                                                                           42109=
                                                                                                                                                                                                                                                                       42266=
42366=
42466=
                                                                                                                                                                                                                                                                                                                                4268B=
                                                                                                                                                                                                                                                                                                                                             42768=
                                                                                                                                                                                                                                                                                                                                                           42898=
                                                                                                                                                                                                                                                                                                                                                                                        43666=
                                                                                                                                                                                                                                                                                                                                                                                                                                                              43566=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              43688=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         43986=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               44388=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -0999+
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    44186=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  44288=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        4766=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              =9355
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  -88851
                                                                                                                     COMMON/CONX/LCID(51,3).SCALE(2).ICONF.ANS(3).IMAG
COMMON/TRANS/IBUF(16).IVAL.NVAL.LTYP.LADR(4).LINE(43).IBYTE
                                                COMMON/NAMES/INPF, IOUTF, IFEAT, KDUM, IDUM, ILOGF, IHIST
                                 SUBROUTINE XFEAT (FEAT, BUF, HID, CLAS, JDX, NBX, IEDJ)
                                                              COMMON/FORM/IFIL, IFN, ICRIN, DUM, NBY, NDSENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  FOR STRIP/PLOT, LOAD VECTOR
                                                                                                                                                  DIMENSION FEAT (JDX, 1), BUF (NBX, 1), HID(1)
                                                                                                                                                                                                                                                                                                                                                                                                                                        PROCESS FEATURE VECTORS
                                                                                                                                                                                                                                                                                                                                                      IF (NEXC. GT.NTC. AND. IFN. EQ. 3) COTO 288
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                IF (IEGFR.NE. B. AND. L. EG. LASV) COTO 15
                                                                                           COMMON/CREC/LASV, IEOFR: NBPR, LB, MAXV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PLUSH BUFFER WHEN FULL
                                                                                                                                                                              EQUIVALENCE (FIKNO, IKNO), (NVEC, FVEC)
                                                                                                                                                                                                                                                                                                                          READ REQUESTED RECORD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CALL NEXVEC(ISEQ,NUMY,NRB,IEOJ)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          IF (NPV.EQ. 1. AND. IFN. EQ. 2) NPV=2
                                                                                                                                                                                                                                                                                                                                                                      IF (NEXC.CT.NTC) GOTO 808
CALL RFEAT (FEAT, JDX, INIT, IEOJ)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AND AT END RECORD
                                                                                                         COMMON/TRACE/ILOG, ITRACE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              IF (NPV.LE.NBY) COTO 98
                                                                                                                                                                                                                                                                                                                                                                                                  IF (IE0J.CT.8) COTO 808
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       FIL.NE.NUMV) COTO 98
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            IF(IE0J.LT.8) 60T0 15
IF(L.NE.NUNY) 60T0 12
                                                                                                                                                                   DIMENSION CLAS(JDX,1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    F(IFN.E9.3) G0T0 58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    BUF (J, NPV) =FEAT (J, L)
                                                                               COMMON/CNUM/NEXC, NTC
                                                                                                                                                                                                                                                                                                 NCMIN-LCID(51,1)
                                                                                                                                                                                                                                                                                                                NCMAX=LCID(51,2
                                                                                                                                                                                                                                                                                                                                                                                                                                                           DO 98 L=1, LASV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         U. 15 J=1,JD
                                                                                                                                                                                                                                                                                                                                                                                                                 NRE=NRE+1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NPV=NPV+1
                                                                                                                                                                                                           JD=JDX-3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CONTINUE
                                                                                                                                                                                                                                                                                                                                           CONTINUE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CONTINUE
                                                                                                                                                                                                                                                                                                                                                                                                                                SED=0
                                                                                                                                                                                                                           B=LIN
                                                                                                                                                                                                                                                        B-NAON
                                                                                                                                                                                                                                          8-03S
                                                                                                                                                                                                                                                                       NFV=1
                                                                                                                                                                                                                                                                                    NRB=0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       39588= 18
39588= 18
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ***3=8286
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         8200=C+++
                                                                                                                                                                                                                                                                                                                              7760=C+++
                                                                                                                                                                                                                                                                                                                                                                                                                                             8588=C+++
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   9803= 12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ###J=2010
                                                                                                                                                                                                                                                                                                                                           7888= 5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  19188= 7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      38888=C
                                                                                                                                                                                                                                                                                                                                                                                                                                                           =8898
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                =88666
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               20000
                                                                                                                                                                  36688=
                                                                                                                                                                                             36868=
36968=
37688=
                                                                                                                                                                                                                                       37100=
                                                                                                                                                                                                                                                       37268=
                                                                                                                                                                                                                                                                                   37588=
37588=
                                                                                                                                                                                                                                                                                                                                                                       =9093
                                                                                                                                                                                                                                                                                                                                                                                      8188=
                                                                                                                                                                                                                                                                                                                                                                                                    8288=
                                                                                                                                                                                                                                                                                                                                                                                                                  8300=
                                                                                                                                                                                                                                                                                                                                                                                                                                184 £6=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          8788=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      =82688
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             -9866
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           39488=
                                                                                             36188=
                                                                                                                       36366=
                                                                                                                                       36486=
                                                                                                                                                                                                                                                                                                                7688=
                                                  35988=
```

```
GENERATES NEXT CONSECUTIVE NVEC UP TO LISV(1)
                                                                                                                                                                                                                GENERATES NEXT NVEC WITHIN GIVEN INTERVAL
                                                                                                                                                                                                                                                                                GENERATES NEXT NVEC FROM LIST
                                                                                         IF(KOPI.EQ.IHS.OR.KOPI.EQ.IHC) COTO 408
IF(IEDJ.NE.S) COTO 808
PROCESS FOLLOW-ON ENTRY
                                                                                                                                                                                                                                                                                                 STUB FOR EXPANSION
                                                                                                                                                                                                                                  STUB FOR EXPANSION
                                                                                                                                                                                                                                                                                                                                                                                                 IF (NOW. LE. LISV (1)) GOTO 488
                                            IF(KOPT.EQ.IHQ)IE0J=-9
IF(KOPT.EQ.IHI) 60T0 200
IF(KOPT.EQ.IHL) 60T0 300
                                                                                                                                                               CALL ERR(10UTF,NN, IEDJ)
IF(IEDJ,LT.0) GOTO 20
                            IF (KOPT.EQ. IHE) 1E0J=-5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 IF (KOPT.EQ. IHC) NVEC=NOW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NORMAL EXIT
                                                                                                                                                                                               60TO 828
                                                                                                                                                                                                                                                                                                                                                                                                                  NOW-NOW-1
                                                                                                                                                                                                                                                                                                                                                                                  NOW-WON+1
               CONTINUE
                                                                                                                                               1E0J=-6
                                                                                                                                                                                                                                                                                                                                                                 CONTINUE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CONTINUE
                                                                                                                                                                                                                                                 CONTINUE
                                                                                                                                                                                                                                                                  $63 0100
                                                                                                                                                                                                                                                                                                                   CONTINUE
                                                                                                                                                                                                                                                                                                                                   COTO 866
                                                                                                                                                                                                                                                                                                                                                                                                                                                  CONTINUE
                                                                                                                                                                                                                                                                                                                                                                                                                                   C070 26
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NVEC=0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ISEQ=1
                                                                                                                                                                                                                                                                                                                                                57688=C***
57788= 488
                                                                                                                                                                                                                                                                                                                 57486= 388
57588=
               55668= 168
                                                                                                                                                                                                                                                57000= 200
                                                                                                                                                                                                                 55888 C+++
                                                                                                                                                                                                                                  26988=C***
                                                                                                                                                                                                                                                                                 57238=C+++
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 883 =38989
55566-0**
                                                                                                                               56399=C++
                                                                                                                                                                                                                                                                                               57386=C+++
                                                                                                                                                                                                                                                                                                                                                                                                                                                  58266= 486
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  58588=C***
                                                                                                                                                                                                                                                                 57106=
                                            55888=
55988=
56888=
                                                                                                                                               56400=
                                                                                                                                                                                              56700=
                                                                                              56188=
                                                                                                                                                                                -009999
                                                                                                                                                                                                                                                                                                                                                                                                 57966=
58666=
58166=
                                                                                                                                                               56589=
                                                                                                                                                                                                                                                                                                                                                                                 57800=
                                                                                                                                                                                                                                                                                                                                                                                                                                                               58386=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  58400=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               58786=
                                                                                                                                                                                                                                                                                                                                                INITIALIZE FOR NEW RECORD-SET/NEW CONTROLS
                                                                                                                DATA IHI, IHL, IHS, IHC, IHE, IHQ/IHI, IHL, IHS, IHC, IHE, IHQ/
                SUBROUTINE NEXVEC(1SEQ.NVEC.NRB.1EOJ)
COMMON/NAMES/INFF.10UTF.1FEAT.1USER.1DUM.1LOGF.1HISG
COMMON/CREC/LASV.1EOFR.NBPR.LB.MAXV
                                                                                                                                                ALLOWS USER TO SPECIFY VECTOR NUMBERS
                                                                                                                                                                                                                C-->CHOOSE CONSECUTIVE TO LISV(1)
S-->SKIP CONSECUTIVE TO LISV(1)
E-->EXII XFEAT FOR THIS CLASS
                                                                                                                                                                                I-->HITHIN INTERVALS (VVV, VVV) ...
                                                                                                                                                                                                                                                                                                                                                                                                                                  FORMATIZEH PICK VECTORS FROM , 13,4H TO , 13/
                                                                                                                                                                                                   .-- YFROM LIST: VVV, VVV, ... (15)
                                                                                                                                                                                                                                                                                                                                                                                                                  FORMAT(16H SELECT CLASS=,13,5H RB= ,12)
                                                                                                                                                                                                                                                                                                                                                                                                  IF (ILDG. GE. 8) WRITE (IOUTF, 988) NEXC, NRB
                                                                                                                                                                                                                                                                                                                                                                                                                                                               OPTION EXPIRED, RENEW IT
                                                                                                                                                                 OPTIONS ARE AS FOLLOWS
                                                                                                                                                                                                                                                                                                                                                                                                                                                 1 19H K, VVV, VVV, ... (15) /2H +)
                                                                                                                                                                                                                                                                    9-->QUIT FORMAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   WRITE (10UTF, 982) NOW+1, LASV
                                                                 COMMON/TRACE/ILOG, ITRACE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  READ (INPF.901) KOPT, LISV
                                                                                                                                                                                                                                                                                                                                   IF(ISEQ.NE.8) COTO 168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FORMAT (A1, 15(1X, 13))
                                                                                   COMYON/CNUM/NEXC, NTC
                                                                                                     DIMENSION LISU(15)
                                                                                                                                                                                                                                                                                                                                                                    CONTINUE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CONTINUE
                                                                                                                                                                                                   53588-0-++
53588-0-++
53588-0-++
53588-0-++
                                                                                                                                                    53188=C***
53288=C***
53388=C***
                                                                                                                                                                                                                                                                                                                                                                                                                      14768= 988
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   55000=C+++
                                                                                                                                                                                                                                                                                                                                                     4380=C+++
                                                                                                                                                                                                                                                                                                                                                                                                                                    14888= 982
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     55188= 29
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     55388= 981
                                                                                                                                   ###J=630ES
                                                                                                                                                                                                                                                                                                                                                                      14488= 19
                                                                                                                                                                                                                                                                                                                                                                                                                                                     54900=
                                                                                                                                                                                                                                                                                                                                                                                     -22549
                                                                                                                                                                                                                                                                                                                                      54200=
                                                                                                                                                                                                                                                                                                                                                                                                      54668=
                                                                                                   2888=
                                                                                                                    52988=
                                                                                                                                                                                                                                                                                                       54000=
                                   52438=
                                                   52588=
52688=
52788=
```

RETURN

```
CORMON/TRANS/IBUF (16), IVAL, NVAL, LTYP, LADR (4), LINE (43), IBYTE BUILDS BUFFER FOR INTEL FORMATTER (ILLINE)
                                                                                                                                                                                                                                                                                                                                       STUB FOR STRIP CHART PLOTTING
                                                                                                                                                                                                                                                                                                                                                                   CLEAR BUF AT EXIT
                                                                                                                                                                                                                                                                                                             SUBROUTINE STRIP (BUF, NX, NY)
DIMENSION BUF (NX, 1)
                                                                       WRITE(IBYTE, 900) LINE
                                           IF (NVAL.LT.16) COTO 18
                                                                                                                                                                                IBUF (NVAL) = IVAL
      SUBROUTINE XMIT
                                                                                                                                                                                                                                                                                                                                                                             DD 29 1=1.NX
DD 19 J=1.NY
BUF (1.J) = 9
CONTINUE
RETURN
END
                                                                                     FORMAT (43A1)
                                                            CALL ILINE
                                                                                                DO 5 I=1,16
                                                                                                                                                                    NVAL=NVAL+1
                                                                                                              (BUF (1) = @
                                                                                                                            LTYP=2
                                                                                                                                          NVAL=8
                                                                                                                                                      CONTINUE
                                                                                                                                                                                              RETURN
                                                                                                                                                                                                                                                                                              51888=
51188=
51288=
51388=C***
                  34166=
34266=C***
                                                                                                                                                                                                                                                                                                                                                                51588=0***
                                                                                                                                                                                                                                                                                                                                                                                                       51868= 19
51968= 28
                                                                                    34600= 968
34700=
                                                                                                                                                      35180= 18
                                                                                                              34966= 5
                                                                                                                                                                                                                                                                                                                                                                               51688=
                                                                                                                                                                                                                                                                                                                                                                                         51766=
                                                                                                                                                                                                                                                                                                                                                                                                                                  52888=
                                              34388=
                                                           34400=
                                                                                                                                                                    35260=
                                                                                                                                        35666=
                                                                                                                                                                                  35386=
                                                                                                                                                                                              35466=
                                                                                                                                                                                                            35588=
                                                 COMMON/NAMES/INPF.10UTF.1FEAT.10LDC.1NEWC.1LOCF.1HISC
USER INPUT RECORD-1D=NEXC
                                                                                                        NEXT-RECORD/15H NN= RECORD-1D/2H #)
           COMMON/FORM/IFIL, IFN, ICRIN, DUM, NBY, NDSENT
                                                                                                                                                                                                                                 IF (NEXC.EQ.LASC.AND.IFIL.EQ.1) GOTO 28
IF (NEXC.EQ.0) GOTO 5
                                                                              NEXC=6--> NEXC=NEXC+1...
                                                                                           NEXC>LASC-->NORMAL EXIT
                                                                                                                                                                                                     IF (ILOG.NE. 8) WRITE (ILOGF, 982) NEXC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1 NTC:NEXC, INEXC, LASC, IFIL, IEOJ
FORMAT(8H NEXREC , 616)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          IF (ILOG. EQ. 1) WRITE (ITRACE, 957)
                                                                                                                                 FORMAT(15H NEXT RECORD= ,12)
                                                                                                                                                                                                                                                                                                                                                      INCREMENT NEXC
                                                                                                                                                                                                                   IF (NEXC. GT. LASC) GOTO 28
                                       COMMON/TRACE/ILOG, ITRACE
                                                                                                                                                                                                                                                                                                                NEXC=0-->ALI
                                                                                                                                                                                                                                                                                                                                                                                               NORMAL EXIT
                                                                                                                                                                                                                                                                                                                                                                                                                                                 ERROR EXIT
SUBROUTINE NEXREC(IEOJ)
                                                                                                                                                                                                                                                                        CALL ERR(IOUTF,NN,IEOJ)
IF(IEOJ.CT.0) GOTO 30
                         COMMON/CNUM/NEXC,NTC
                                                                                                                                                IF (IALL.EQ.1) COTO 18
                                                                                                                                                                                         READ (INPF, 981) NEXC
                                                                                                                                                                           RITE(10UTF,988)
                                                                                                        FORMAT (13H
                                                                                                                                                                                                                                                                                                                                                                                 NEXC=NEXC+1
                                                                                                                        FORMAT (12)
                                                                                                                                                                                                                                                                                                                                                                                                                                    ASC=NEXC
                                                                                                                                                                                                                                                                                                                            CONTINUE
                                                                                                                                                                CONTINUE
                                                                                                                                                                                                                                                                                                                                                                                                           CONTINUE
                                                                                                                                                                                                                                                                                                                                                                   CONTINUE
                                                                                                                                                                                                                                                                                                                                                                                                                                                              CONTINUE
                                                                                                                                                                                                                                                             3-=C03I
                                                                                                                                                                                                                                                                                                 COTO 1
                                                                                                                                                                                                                                                                                                                                           IALL=1
                                                                                                                                                                                                                                                                      61888=
61188=
61289=
61388=C***
                                                                                                        29888= 988
                                                                5958B=C++
                                                                                29688=C++
                                                                                                                                  58888= 982
                                                                                                                                                                                                                                                                                                                                                      61688=C+++
                                                                                                                                                                                                                                                                                                                                                                                              11988=C+++
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       62430= 957
                                                                                             59768-6##
                                                                                                                                                                                                                                                                                                                                                                   61760= 19
61866=
                                                                                                                        59908= 981
                                                                                                                                                                                                                                                                                                                                                                                                                                                   2360=C+++
                                                                                                                                                68168= 1
68288= 1
68388=
68488=
68588=
                                                                                                                                                                                                                                                                                                                            61468= 5
                                                                                                                                                                                                                                                                                                                                                                                                           32 -2882
                                                                                                                                                                                                                                                                                                                                                                                                                                                              52488= 38
                                                                                                                                                                                                                   -889989
                                                                                                                                                                                                                               68788=
68888=
68988=
                                                                                                                                                                                                                                                                                                                                          61500=
                                                                                                                                                                                                                                                                                                                                                                                                                       52188=
             59268=
                                      59318=
                                                                                                                                                                                                                                                                                                                                                                                                                                     62288=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         62428=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            52416=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               62608=
```

		49738=C+++	CLEAR BUFFER AND RETURN
		49860=	DO 26 N1=1,NX
45488=		=50665	DO 19 112=1,NY
45580=	SUBROUTINE PICT(BUF, HID, NX, NY)	52000=	BUF (M1, N2) = 0.
45688=	COMMON/FORM/IFIL, IFN, ICRIN, DUM, NBY, NDSENT	50100= 19	CONTINIE
45738=	COMMON/CRIM/NETC, NTC	55266= 28	CONTINUE
45988=	CHAMPA PER SEC. 75C. FL. 1CPS. TGRID	58306=	ביייי ביייי
15066-	COMMON WANTED THOSE TOTAL TEEDT TO DE THEBET THIST	50000-	פער רושפר
-99101	SOUTH AND AND THE PARTY OF THE	100100	CHLL ROYMES LIET/381
45558=	COMMUN/INACE/ILUGIINACE	=80080	CALL ANYODE
=92997	DIMENSION BUF (MX-1) - SID (1) - LNAM (3)	20,000=0+**	EXIT
46169=	DATA LNAM(1), LNAM(2), LNAM(3)/ANFEAT, ANCLAS, ANHIST/	52755= 33	CONTINUE
44756=	חסדם דוב/ווב/	565.095	No. I Luca
20704	DATE THE THE PROPERTY OF THE P	-20000-	
10000-0111	ברחו מעוגבע-יושוונרטוזנרבשה מטרבה	-07/70	CND
46408=C+++			
46500= 984	FORMATCIAH PLOT FOLLOWS,	=2266	
46.63G=	*	16669=	
300-000	CODATIAL	188	SUBROUTINE FILBUF (HIST, BUE, NHY, M. NY, NY, NY, 100M)
Car - 30/0+	בחוניון ווודו	10000	POSESSI TENDENCE TENDENCE DE L'ANDRE DE L'AN
-03395	WRITE (10UTF, 984)	-63761	בחשומות ומארבי ובחפיו ומארב
46968=	READ(INPF,905) ICH	16368=	DIMENSION HIST (NHX, 1), BUF (NX, NY)
87230=	TELLICH ME THE COTO 30	:69191	COMMON/NAMES/INPF, IOUTF, IFEAT, IOLDC, INEWC, ILGGF, IHISC
A7166-	15 1100 ED 0000 CDTD 14	18588=	COMMON/HREC/ISYM:KTR.LABLH,NI,NBUC.JD
-1120	ייייי בייייי שני שני שני שני שני שני שני שני שנ	16600=0+++	STATES : MAGGGTOTA UTTU GERRIE TO 18 2 1117
4443=88715	INITIALIZE ON FIRST CALL	18308-0111	
47388=	INC=999	=99/61	NI = I
-23525	IGRID=2	18888=	N2=8
47596=	TF/TCRIM_FQ_THC1TCRIM=3	16966=	K1=9
47£06-	CALL INITITIES	11668=	K2=NHX
-41001-	בשרר זעוווורטן	11100=	TELLICON EN 11 COTO 28
4443=83/15	PLOT PICTURE	11100-	Tricon To On the little of
47000= 18	CONTINUE	=89711	
-22614	CALL ERASE	11388=	IF(ICON.ME.2) GOTO 28
#5000g=	CALL MOUDES ISB. 7881	11400=	N. STATE
-danot	Call Course of the Call of the	115000	W2=VT0+7
40100=	CALL MUVARUS (28) /86)	11144	ME-NIM!
48280=C###	LABEL PICTURE	-02011	N1=N1K+3
48300=	CALL ANYODE	11/25=	KZ=NHX
48486=	WRITE(10UTF, 981) LNAM(IFIL), NEXC	11820= 28	CONTINUE
186 = 50237	FORMAT (2X, 44, 8H F) 45S= ,13	11969=	DO 38 J=J1,JN
40190=	1 / 224 ENTER SCALE CONTROLS.	12000=	IF (11.06.1E.1) GOTO 25
20700	2 / CELL TAT T T COM 2	17103=	TELLING NE SINDITELLINGE OGI) I. (HIST (N. 11. N=N1. N2)
-03/04	ל ו ואם מסיפורייקוברייקע בי	12200= 901	CODEST COOR COMPONENT NEW AND COOR COMPONENT NEW AND COOR COMPONENT NEW AND COOR COMPONENT NEW AND COOR COMPONENT NEW COOR COMP
48868=	REAU (INF 1982) USC 1250 EL		TARRADE SYSUE
48588= 982	FORMAT (F4.1:1X:F4.1:1X:F3.0)		CATHOODING AND THE ADDITION OF THE OF THE OF THE OFFICE OFFICE OFFICE OFFICE OFFICE OFFICE OFFICE OFFICE OFFICE OF
49888= 983	FORMAT(2X,F4.1,1X,F4.1,1X,F3.0)	=80571	IXIZ, ZH= ,8(IXE9.3))
49188=	IF (ILOC.NE. 8) WRITE (ILOCF, 981) NEXC, LNAM (IFIL)	17508=	IF (ILOG.NE.2) COTO 25
49208=	IF (ILOC.NE.0) WRITE (ILOGF, 903) BSC, ZSC, EL	12688=	IF (ILOG.NE.@) WRITE (ILOGF, 902) (HIST (K, J), K=K1, K2)
49386=	CALL PLOTED (BUF, HID, NY, NY)	12763= 962	FORMAT( ((( 28(1XF5.8) ))) )
49498=0444	PAUSE AND CHECK FOR EXITINDN BLANK ICH)	12888= 25	CONTINUE
40530	CALL DEPREDITED TY. IY.	12969=	DO 22 K=K1,K2
49630	1 CTC CC	13686= 22	BUF(K, J) = HIST(K, J)
110001	וונוייבאיזרו פפיס דא	13168= 36	CONTINIE
		10088-	DET TON
		-09701	NE IUNA
		-00001	END

			*******TAPEIN**********		
			TE TAPE READ UTILITY FOR B	##\$###################################	
					000003
9487				2-CHARS FOR BYTE	000380
ØØ3C			CH 180/20 CMD PRO		000390
0348			48H CHARACTER INP		000391
Ø2FE			FEH   CONVERTS TO B		000392
Ø33A			33AH JERROR HANDLER		000393
3850		ORG 3850H		TAPE READ	868776
38 <b>5ø</b>	CD4803	XC05: CALL GETCH	READ A CHAR	000148	000780
3853	FE3A	CPI ':'	START LINE PROCESSING	000150	999799
3855	C25038	JNZ XCØ5	; AT THE FIRST ':'	000160	868866
3858	AF	XRA A	SETUP	900170	605816
3859	57	MOV B.A	FOR CHECKSUM	000180	999829
385A	CD7F38	CALL BYTEX	READ PAIR OF HEX CHARS	000190	000030
385D	CA3CØØ	JZ GETCM	QUIT A Ø RECORD LEN	699268	888848
3840	5F	MOV EIA	SAVE RECLEN	659210	000850
3861	CD7F38	CALL BYTEX	GET HI LOAD ADDRESS	009220	698686
3864	67	MOV HIA	AND SAVE IN H	000239	666876
3865	CD7F38	CALL BYTEX	GET LO LOAD ADDRESS	000245	000880
3868	6F	MOV LA	AND SAVE IN L	000250	008890
3869	CD7F38	CALL BYTEX	GET RECORD TYPE	000260	000900
3860	4B	MOV CIE	; AND SAVE IN C	609276	000910
386D	CD7F38	XC10: CALL BYTEX	FREAD TAPE DATA, AND	ØØ628Ø	000920
3870	77	MOV M.A	STORE AT MEMORY LOC	000290	000930
3871	23	INX H	GET NEXT MEM-LOC	009300	000940
3872	1D	DCR E	DECR REC-LEN	000310	000950
3873	C26D38	JNZ XC10	; AND LOOP	000320	000960
3876	CD7F38	CALL BYTEX	GET CHECKSUM	000330	000970
3879	C23AØ3	JNZ ERROR	; AND TEST LINE	000340	099980
387C	C35Ø38	JMP XCØ5	IF OK, GET NEXT LINE	000350	000990
387F	C5	BYTEX: PUSH B	ASCII BYTE INPUT,	000360	001000
3880	CD48Ø3	CALL GETCH	FREAD CHAR	000370	881818
3883	4F	MOV C.A	i	000380	001020
3884	CDFE02	CALL CNVBN	CHAR>HEXADECIMAL	000390	001030
3887	97	RLC	; MOVE	000400	001040
3888	Ø7	RLC	; TO	000410	001050
3889	07	RLC	; UPPER	000420	991959
388A	<b>Ø7</b>	RLC	; 4-BITS	000430	001070
388B	47	MOV B.A	SAVE RESULT IN B	000440	001080
3880	CD48Ø3	CALL GETCH	FREAD CHARACTER	000450	001090
388F	4F	MOV CIA	i	000466	081100
3890	CDFEØ2	CALL CNVBN	CONVERT	000470	881118
3893	EG	ORA B	FOR IN UPPER 4 BITS	000480	991129
3894	4F	KOV C.A	ISAVE	000490	001130
3895	82	ADD D	INCREMENT CHECKSUN	003500	001140
3896	57	MOV D.A	4	000519	001150
3897	79	MOV A.C	RESTORE HEX TO A	000520	901160
3898	C1	POP B	FRESTORE B	000530	001176
3899	C9	RET	i	000540	001180
			180/20 SYSTEM CODE	000550	991199

i	GETCH: CALL CI	FREADS CHAR	009560	981299
i	ANI 7FH	TURNS OFF PARITY BIT	000570	881218
;	MOV CIA	RETURN IN CREC	000580	881228
i	RET	i	882598	001230
i	C1: IN OEDH	IGET CONSOLE STATUS	669666	991249
i	ANI 02H	CHECK BUFFER RBY	889618	881258
i	JZ CI	; LOOP IF NOT	800620	681266
i	IN OECH	INPUT IF RDY	609638	001270
;	RET	i	969646	991289
i	CHVEN: MOV A.C	; CONVERT TO BINARY	000650	881298
;	SUI '8'	SUBTR 'B' CODE	888668	001300
i	CPI 18	CHECK 0-9 RESULT	000670	661316
;	RM	FIF SO, DONE	688688	001320
i	SUI 7	FELSE RESULT> 7-23	883698	001330
;	RET	i	000700	881346
	END	;	998718	861341

NO PROCRAM ERRORS

8080 MACRO ASSEMBLER, VER 2.2 ERRORS = 6 PAGE 3

SYMBOL TABLE

# 81

A	8007	B	6986	EYTEX	387F	C	6001
CHYBN	Ø2FE	D	6662	F	0003	ERROR	033A
GETCH	6348	GETCH	603C	н	6664	1	0005
H	0006	TUOMN	8487 ¥	PSW	0366	SP	6888
XC95	3858	XCIB	384B				

STOP

2.078 CP SECONDS EXECUTION TIME

001 BLOCKS1 0 802 A 6666670 Ø83 B 0606000 004 BYTEX 0341770 005 C 6000010 996 CNVEN 9813760 007 B 00000020 998 E 6000030 999 ERROR 9314720 Ø18 CETCH Ø815180 Ø11 GETCH ØØEØ748 912 H 6030640 #13 L 0000050 614 K 09000060 015 NMOUT 0022070 016 PSW 0000000 017 SP 8888860 Ø18 XCØ5 Ø341200 \$19 XC18 \$341550

:10385000CD4603FE3ACZ5038AF57CD7F38CA3C003E :103860005FCD7F3867CD7F386FCD7F3848CD7F38C8 :1038700077231DC26D38CD7F38C23A03C35038C597 :10388000CD48034FCDFE820707070747CD48034F3A :04389000CDFE02D04F825779C1C986 :0000000000

APPENDIX J
DECIDE Module

```
000100
                 ;****************CLASSIFIER FOR 'BOX80' SYSTEM***************
                                                                                     000200
                 ;***************DESIGNED FOR INTEL 80/20 USE ***************
                                                                                     999399
                 ;****
                                                                                     000400
                 ;***********DATA STRUCTURES FOR DECIDE************
                                                                                     999599
                 ;CLAS(J,I) ICLAS(IST)=1,CAV(1,I),CSDL(1,I),CSDR(1,I),...
                                                                                     883688
                             ..., CAV(JD, I), CSDL(JD, I), CSDR(JD, I),...
                                                                                     992799
                                                                                     000000
                             ICLAS(LAS)=IC,CAV(1,IC),CSBL(1,IC),CSBR(1,IC),...
                             ... CAV(JD.IC).CSDL(JD.IC).CSDR(JD.IC) #
                                                                                     900900
                  iFEAT(J,LL) IKNO=1.1VEC=1.FEAT(1.LL)....FEAT(JD,LL)....
                                                                                     001000
                             IKNO=1.IVEC=NV.FEAT(1.LL)....FEAT(JD.LL)....
                                                                                     001160
                             IKNO=IC.IVEC=NV.FEAT(1,LL)....FEAT(JD.LL) #
                                                                                     001200
                                                                                     001210
                                                                                     001220
                                                                                     001230
                 ;******
                                EQUATE STATEMENTS
                                                                                     001300
8968
                 START:
                                              BEGIN PROGRAM LABLE
                                                                                     991319
                             DS
                 ****THESE EQUATES MUST BE RESET FOR EACH DATA SET
                                                                                     001320
                                              INITIAL STACK ADDRESS (POINTER)
3F8@
                 STACK
                             EQU
                                    3F8@H
                                                                                     001400
                                                                                     001450
3F49
                 PILE
                             EQU
                                     3F40H
                                              ISPACE FOR STACK
3000
                                     3DØØH
                                              BASE-A FOR FEAT FILE BLOCK
                                                                                     881588
                 FEAT
                             EQU
3B8@
                 CLAS
                             EQU
                                     3B88H
                                              BASE-A FOR CLAS FILE DATA AREA
                                                                                     001600
                                              JUSART STATUS PORT ADDRESS
                                                                                     001700
GGED
                 USTAT
                             EQU
                                     BEDH
0001
                 OK2G0
                             EQU
                                     Ø1H
                                              FREADY STATUS
                                                                                     991899
                                              JUSART PORT ADDRESS
                 UPORT
                                                                                     991999
BREC
                             EQU
                                     ØECH
                 CODE
                                     3800H
                                              JADDRESS OF CODE BLOCK
                                                                                     001910
3800
                             EDU
3940
                 DATA
                             EQU
                                     3948H
                                              HADDRESS OF DATA BLOCK
                                                                                     001920
3989
                 SUBS
                             EQU
                                     3986H
                                              ADDRESS OF SUBROUTINE BLOCK
                                                                                     881938
6003
                 EJD
                             EQU
                                     Ø3H
                                              HUMBER OF DIMENSIONS
                                                                                     001932
                 ELB
                                     Ø3H
                                              NUMBER OF FEATURE VECTORS PER BLOCK
                                                                                     001934
6663
                             EQU
8883
                 EIC EQU
                             Ø3H
                                     NUMBER OF CLASSES
                                                                                     001936
                                                                                     661946
                                                                                     881958
                                                                                     991969
                             ORG
                                    CODE
                                                                                     002008
3800
                 ****BEGIN PROCESS
                                                                                     902200
                 ;***GOTO IF7
                                                                                     002300
3800
                                     SPISTACK FINITIALIZE STACK POINTER
                                                                                     982488
      318Ø3F
                 BPØ:
                             LXI
3803
      3E63
                             KVI
                                    A.EJD
                                              SET UP
                                                                                     002416
3805
      325E39
                             STA
                                     JD
                                              ; JD= NUMBER OF DIMENSIONS
                                                                                     002412
3808
      3EØ3
                             MVI
                                    A.ELB
                                              SET UP
                                                                                     002414
389A
      326739
                                    LB
                                              ; NUMBER OF VECTORS PER BLOCK
                                                                                     002416
                             STA
38@D
      3EØ3
                             MVI
                                    A.EIC
                                              ISET UP
                                                                                     662418
                                              : NUMBER OF CLASSES
38ØF
      325F39
                                                                                     002420
                                     IC
                             STA
3812
      C3FØ38
                             JMP
                                     IF7
                                              GET NEXT FEAT BLOCK
                                                                                     002500
                 S###NEXT FVEC
                                                                                     882688
                 i***LL=LL+1
                                                                                     982788
                                                                                     882888
                 #### IF ((LB-LL).LT.Ø) GOTO OS6
                 ### IKNO=FVEC (1.LL)
                                                                                     882988
                 ###IVEC=FVEC (2.LL)
                                                                                    003000
                 ;*** I = IC
                                                                                    993199
```

AD-A066 197

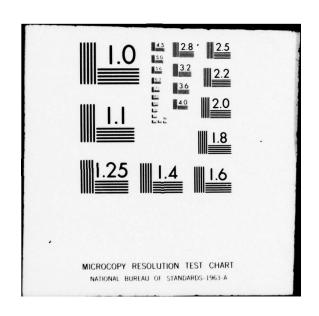
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCH-ETC F/6 5/8

A DEVELOPMENT SYSTEM FOR MICROPROCESSOR BASED PATTERN RECOGNIZE--ETC(U)

DEC 78 JR LEARY

AFIT/OCS/EE/78-12-VOL-2

ADMINITED AFIT/OCS/EE/78-12-VOL-



		*******	255			040154
3815	215339	;***MND= NV1:	LXI	HILL	GET FEAT VECTOR	003150 003200
3818	46	1441.	MOA	B,M	; INDEX=LL,	993399
3819	94		INR	B	INCREMENT	003400
381A	3A6739		LDA	LB	GET LB AND	883429
381D	90		SUB	В	; CALC (LB-LL)	003420
381E	FADC38		JM	086	COTO OS6 IF LT ZERO	003500
3821	70		NOV	M,B	; ELSE SAVE NEW LL	883688
3822	2A5839		LHLD	AFL	GET FEAT COMPONENT POINTER	003700
3825	23		INX	H	; INCREMENT	003890
3826	7E		NOA	A,M	AND	003900
3827	325439		STA	IKNO	SAVE IKNO	964988
382A	23		INX	H	; INCREMENT	994199
382B	7E		KOV	A,M	; AND	984299
382C	325739		STA	IVEC	SAVE IVEC	994399
382F	225A39		SHLD	AFLØ	SAVE FEAT VECTOR BASE A -1	994499
3832	218Ø3B		LXI	H, CLAS	GET CLAS BASE-A	994599
3835	2B		DCX	H	; AND DECREMENT	994559
3836	226039		SHLD	ACLI	; TO SAVE A(CLAS)-1	394699
3839	215F39		LXI	H,IC	GET NO. CLASSES (IC)	384708
383C	7E		VOM	A.M	; AND SET	994899
383D	325D39		STA	I	CLAS INDEX=I	004900
3840	3EFF		MVI	A. ØFFH	PRESET MND	804950
3842	326539		STA	MND	; TO 255	984968
		: ***NEXT	CLASS			905990
		;***[=[-	1			885188
			.EQ. 6) GOT	0 0A5		805200
		;***ICLA	S=CLAS(1,1	)		005300
		;***J=JD				005400
		;###MXF=	Ø			995459
3845	215D39	NC2:	LXI	H+I	IGET CLAS	005500
3848	7E		MOV	A.M	; INDEX=I	895699
3849	30		DCR	A	; DECREMENT	005700
384A	FAB938		JM	OA5	GOTO DAS IF ZERO	995899
384D	77		VOM	H,A	; ELSE SAVE NEW I	885989
384E	23		INX	H	(GET NO DIMENSIONS (JD)	986939
384F	7E		VOM	A,M	; AND SET	986199
3850	325039		STA	J	; J-LIMIT ON FEATS	996159
3853	246039		LHLD	ACLI	GET CLAS BASE-A -1	996299
3856	23		INX	H	; INCREMENT	886258
3857	7E		VOM	A,M	; TO GET ICLAS ; AND TO SAVE	696300
3858 385B	326239 226Ø39		STA SHLD	ICLAS ACLI	A(NEXT CAV)-1	006403 006500
385E	2A5A39		LHLD	AFLØ	GET FEAT VECTOR BASE -1	806600
3861	225839		SHLD	AFL	; AND RESET COMPONENT POINTER	865788
3864	3EØØ		MVI	A,ØD	PRESET MXF	926759
3866	326339		STA	MXF	; TO MIN	006760
0000	J. 10007	; * * * NEXT		IINI	, io an	008900
		; ###J=J-				006900
			.Eq.Ø) COT	0 DC4		9979999
			V(J.I).			897199

		;***Y=CSDL (J.1),	Y (=C)		987299
		i***Z=CSDR(J.1),	Z(=D)		007300
		into FEAT (Joll)			607400
		1111X=X-F			997599
		isself (X CE B) G	OTO NESA		007600
		1=fff; Z			887788
		isseNF3A: T=X/Y			997899
		1444T=X/Y			887988
		itte [F (MXF.GE.T)	GOTO NF3		998999
		itt KXF=T			998199
		SHIE COTO NF3			008150
3869	215039	NF3: LXI	HoJ	GET A(J-LIMIT)	998299
3860		DCR	K	AND DECREMENT MEMORY	008250
3891		JM	DC4	GOTO BC4 IF LT ZERO	008300
3870		LHLD	ACLI	IGET BASE-A FOR PROTO(J.1)	998499
3873		INX	H	# BUMP TO NEXT ENTRY	008500
3874		MOV	A.M	GET CAV(J.I)	008600
3875		INX	H	; BUMP TO NEXT ENTRY	008700
3876		KOV	D.M	GET CSDL(J,I), DIVISOR	988899
3877		INX	H	; BUMP TO NEXT ENTRY	008900
3878		NOA	C+H	GET CSDR(J,I), DIVISOR	999909
3879		SHLI		ISAVE BASE-A FOR PROTO(J.I)	999100
3870		LHLD		IGET FEAT VECTOR BASE	889288
387F		INX	H	BUMP TO NEXT COMPONENT	009300
3882		SHLI		SAVE NEW BASE	009400
3883		SUB	H	:X=CAV(J.I)-FEAT(J.L)	009500
3884		JP	NF3A	; GOTO NF3A IF POS	009600
3887	51	NOV	D.C	SET Y=CSDR(J,I), DIVISOR	009700
3888		NF3A: MOV	C.A	FELSE Y=CSDL(J,I)	889888
3889	AF AF	XRA	A	THEN ZERO B TO	009900
3888	47	MOV	. B.A	; SET BC = X, DIVIDEND	010000
388E	CD7F39	CALL	DIV	FLET T=X/Y , QUOTIENT IN C-REG	010100
388E	1698	IVM	D, ØD	; AND SETUP	919119
3890	59	VOM	3,3	; IN DE FOR COMPARE	010120
3891	2A6339	LHLD	MXF	CET MXF INTO HL	010200
3894	CDDA39	CALL	HILD	FIF MXF GE T	010300
3897	DA6938	JC	NF3	GOTO NEXT FEAT	818488
3894	226339	SHLD	MXF	FELSE SAVE T AT MXF	010500
3891	C36938	JMP	NF3	; GOTO NEXT FEAT	010600
		###DECIDE CLASS			919799
		### IF (MXF.GT.MN	D) GOTO NEX	T CLAS	010800
		isss MND=MXF			919999
		f### ANS=ICLAS			911989
		state GOTO NC2			911198
38A6		DC4: LHLD		FGET MND .	911288
38A3		XCHC		; INTO DE AND	911366
3844		. LHLD		HXF INTO HL	911499
38A7		CALL		FIF MXF GT MND	011500
3844		JC	NC2	GOTO NEXT CLAS	011600
38AI		SHLD		FELSE SAVE MXF AT MND	011700
3886	3A6239	LDA	ICLAS	IGET ICLAS AND	011800

36B3	325539		STA	ANS	; SAVE AT ANS	011900
3886	C34538		JMP	NC2	THEN GOTO NEXT CLAS	012000
		;***OUTPUT	ANSHER			812168
		; * * * > LL ,	IKNO ANS			012200
		;*** IF (1KN	O.EQ.ANS	) GOTO OAS	A	012300
		;*** 10K	=10K+1			812488
		inen 601	O NV1			012500
		; ### OA5A:	ING=ING	+1		012600
		itt GOT	O NV1			912769
38B9	215339	0A5:	LXI	HILL	GET A(LL) INTO HL	012800
38BC	114039		LXI	DILINE	i	012900
38BF	Ø613		MAI	B,19D	ILINE LENGTH	012950
3801	CDØ13A		CALL	OUTB	AND OUTPUT 3 VALUES	Ø13ØØØ
3804	3A5439		LDA	IKNO	GET IKNO -	013100
3807	215539		FXI	HIANS	FIGNS EQ IKNO)	013200
38CA			CNP	M	GOTO GASA	Ø133ØØ
38CB	CAD538		JZ	OA5A	/CLUE	210100
38CE	216939		LXI	H, ING	; BUMP	013500
38D1	34		INR	H	ERROR COUNT	013600
3802	C31538		JMP	NV1	AND GOTO NEXT F-VECTOR	013700
3805	216839	CASA:	LXI	H.10K	BUMP	013800
3808	34		INR	K	CORRECT COUNT	013900
3809	C31538		JMP	NV1	AND GOTO NEXT F-VECTOR	Ø14889
		;***OUTPUT				914199
		;***OUTPUT	CELEBROTON CO.	HEADER		814200
		;***>LB,				814300
38DC	217639	1950	LXI	H,SHØ1	GET A(SUM HEADER) INTO HL	814488
38DF	6699		MVI	B,9D	AND NO. CHARS INTO B	014500
38E1	CDEC39		CALL	CLOOP	THEN OUTPUT	814688
38E4	216739		LXI	H+LB	GET A(LB) INTO HL	914799
38E7	114039		LXI	DILINE	I THE LEWATH	Ø148ØØ
38EA	0613		MVI	B,19D	ILINE LENGTH	914859
38EC	CDØ13A		CALL	GUTB	AND OUTPUT 3 VALUES	014900 015000
	0.5	,********			FTER ONE BLOCK	
38EF	CF		RST	1	•	015166 015266
		SEEE INITIA		UCK		015300
		;***IOK=IN		H UCARER		Ø15400
		;***LL=LB	DEC1316	א אבאטבא		915500
38FØ	AF	1F7:	XRA	A	CLEAR A AND	915600
38F1	326839	357.	STA	10K	ZERO	915766
38F4	326939		STA	ING	• HALLIEA	*****
38F7	AF		XRA	A	INITIALIZE VECTOR	916999
38F8	325339		STA	iL	i INDEX.LL	916199
38FB	216B39		LXI	H.DHØ1	OUTPUT	816288
38FE	666B		HVI	B+11B	; DECISION	016300
3988	CDEC39		CALL	CLOOP	; HEADER	616466
2100	ULLUST		UNCE	CLUVI	GET NEXT FEAT BLOCK	Ø1645Ø
3903	21003D		LXI	H.FEAT	FRESET FEAT VECTOR	Ø16500
3986	2B		DCX	H	; BASE ADDRESS	016550
3907	225839		SHLB	AFL	TO A (FEAT BLOCK) -1	916699
4101	LLOUDI		O.L.			

39ØA	C31538	;	JMP	NV1	1	Ø168ØØ Ø169ØØ
		i				017000
		į			WORK AREA	917168
		;				@17200
		;				017300
3948			ORG	DATA	; OUTPUT AREA	017400
0000		LINE:	DS	e	JOUTPUT WORK AREA	017500
3940	60		DB	Ø	FIRST VALUE	817688
3941	0000		DW	g	;	017650
3943	6369		DW	Ø		017660
3945	20	SP1:	DB	11	; SPACE	017700
3946	00		DB	g	SECOND VALUE	Ø178ØØ
3947	0000		DW	B		017850
3949	0000		DW	Ø		Ø1786Ø
394B	20	SP2:	DB	1 1	; SPACE	917900
394C	68		DB	Ø	THIRD VALUE	018006
394B	0000		DW	g	1	018050
394F	0300		DW	g	;	Ø18Ø6Ø
3951	ØA .	SP3:	DB	HAB	ICR .	Ø181ØØ
3952	ØD	SP4:	DB	ØDH	LINE FEED	018200
		;				018300
		;				018400
		;			VARIABLES	Ø185ØØ
		;				018600
		;				Ø187Ø6
3953	00	LL:	DB	g	POINTS TO FEAT VEC	Ø188ØØ
3954	00	IKNO:	DB	g	JA PRIORI CLASS OF F FEAT BLOCK	018900
3955	00	ANS:	DB	Ø	DECISION CLASS	019000
3956	3D	EDEC:	DB	1=1	FEND DECISION LINE	019100
3957	00	IVEC:	DE	Ø	VECTOR NUMBER	@19200
3958	6999	AFL:	DW	g	POINTS TO F-VEC COMPONENT	019300
395A	6900	AFLØ:	DW	8	FEATURE VECTOR BASE-A	019400
395C	68	J:	DB	Ø	FEATURE PROCESS LIMIT	019450
395D	69	I:	DB	Ø	FOINTER SHOWS PROTO I	919699
395E	09	JD:	DB	g	NUMBER OF FEATURE DIMENSIONS ***	@1965@
395F	88	IC:	DB	g	NUMBEROF CLASSES	@1966@
3960	6689	ACLI:	DW	Ø	POINTS TO PROTOTYPE COMPONENT	019700
3962	00	ICLAS:	DB	g	FLABELS EACH PROTOTYPE	@198@@
3963	6668	MXF:	DW	8	FR-INF MAG FOR DIS VECTOR	019900
3965	0000	MNB:	DW	g	MINIMUM R-INF MAG	020000
3967	00	FB:	DB	g	NUMBER F-VECS IN FEAT BLOCK	020100
3968	08	10K:	DB	0	COUNT OF CORRECT DECISIONS THIS BLOCK	020200
3969	00	ING:	DB	g	COUNT OF ERROR DECISIONS THIS B.	020300
396A	3D	ESUM:	DB	1=1	FEND SUMMARY LINE	926460
		;			DECISION HEADER	020500
396B	44	DHØ1:	DB	44H	i D	929699
3966	45	DHØ2:	DB	45H	; E	929799
396D	43	DHø3:	DB	43H	; C	929899
	49	DH#4:	DB	49H	11	929999
396E 396F	53	DHØ5:	DB	53H	; s	621666

DH06: DH07: DH08: DH10: DH11: DH12: ; SH01: SH02: SH04: SH05: SH06: SH06: SH07: SH08: SH08: SH09: ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ;	DB D	49H 4FH 4EH 53H 8DH 8AH 53H 4DH 4DH 41H 52H 54H 80H		O N S LF CR SUMMARY HEADER S U M H A R Y LF	021100 021200 021300 021400 021500 021500 021500 021700 021800 021900 022200 022200 022200 022300 022400 022400 022500 022500 022500 022500
DHES: DH10: BH11: DH12: ; SH01: SH02: SH03: SH04: SH05: SH06: SH07: SH08: SH09: ; ;	DB DB DB DB DB DB DB DB DB	4EH 53H 8DH 8AH 53H 4DH 4DH 41H 52H 54H		N S LF CR SUMMARY HEADER S U H A R R Y LF CR	821388 821488 821588 821788 821788 821886 822888 822288 822288 822288 822588 822588 822588 822588 822588
DH10: BH11: DH12: ; SH01: SH02: SH03: SH04: SH05: SH06: SH09: ; ;	DB	53H 8DH 8AH 53H 55H 4DH 4DH 41H 52H 54H		S LF CR SUMMARY HEADER S U H H A A R Y -' LF CR	921499 921599 921699 921799 921899 922999 922299 922399 922498 922499 922599 922599 922599
BH11: DH12: ; SHØ1: SHØ2: SHØ3: SHØ4: SHØ5: SHØ6: SHØ6: SHØ7: SHØ8: SHØ8: ; ;	DB DB DB DB DB DB DB DB	8DH 8AH 53H 55H 4DH 4DH 41H 52H 54H		LF CR SUMMARY HEADER S U H H A R R LF CR	021500 021600 021800 021900 022000 022000 022200 022200 022300 022400 022500 022500 022500 022500
DH12: ;; SH01: SH02: SH03: SH04: SH05: SH06: SH07: SH08: SH08: ;; ;;	DB DB DB DB DB DB DB DB	9AH 53H 55H 4DH 4DH 41H 52H 54H	; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ;	CR SUMMARY HEADER S U M H A A R R Y LF CR	021600 021700 021800 021900 022000 022200 022200 022300 0224500 022500 022500 022800 022800 022900
; SHØ1: SHØ2: SHØ3: SHØ4: SHØ5: SHØ6: SHØ7: SHØ9: ;	DE DB DB DB	53H 55H 4DH 4DH 41H 52H 54H		SUMMARY HEADER U H H A R Y LF CR	621766 621866 621966 622166 622206 622306 622306 622466 622466 622460 622460 622735 622806 622908
SH01: SH02: SH03: SH04: SH05: SH06: SH07: SH09: ;;;;;	DB DB DB DB DB DB	55H 4DH 4DH 41H 52H 54H 6DU		S U H H A R Y LF CR	021800 021900 022000 022100 022200 022300 022400 022500 022500 022500 022900
SH02: SH03: SH04: SH05: SH06: SH07: SH09: SH09: ;	DB DB DB DB DB DB	55H 4DH 4DH 41H 52H 54H 6DU	* * * * * * * * * * * * * * * * * * * *	U H A R Y LF CR	821988 822888 822288 822388 822388 822488 822588 822788 822788 822888 822988
SH03: SH04: SH05: SH06: SH07: SH09: SH09: ;	DB DB DB DB DB DB	40H 40H 41H 52H 54H 60U	* * * * * * * *	M A R Y LF CR	922008 622100 922200 922300 922400 922500 922500 922500 922500 922500
SH04: SH05: SH06: SH07: SH08: SH09: ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;	DB DB DB DB DB	40H 41H 52H 54H 60U		M A R Y LF CR	622100 622200 622300 622400 622500 622700 622700 622800 622900
SH#5: SH#6: SH#7: SH#9: SH#9: ; ;	DB DB DB	41H 52H 54H 60H	; ; ; ;	A R Y LF CR	022208 022309 022408 022508 022609 022750 022808 022908
SH06: SH07: SH08: SH09: ; ; ; ;	DE DB DB	52H 54H 00H	; ; ;	R Y LF CR	622366 622468 622568 622666 622758 622868 622968 623668
SH06: SH07: SH08: SH09: ; ; ; ;	DB DB	52H 54H 00H	;	Y LF CR	622468 622568 62260 622733 622898 622908 623608
;***BIV	DB DB	ØOH	;	LF CR	822508 82260 822788 822788 822908 823888
;***BIV	DB DB	ØOH	;	LF CR	022600 022733 022833 022903 023003
; ; ; ; ; ;***BIV		ØAH	·		822788 622888 622988 623888
; ; ; ; ; ;***BIV			·		822788 622888 622988 623888
; ; ; ; ;			s	UBROUTINES	622866 622988 623686
			S	UBROUTINES	022900 023000
				OBNOOT THEO	823888
					DECIED
					028415
			:	DIVIDE (INTRPSØ, P18)	028420
	BC-	DIVIDEND UN			Ø2843Ø
;***		DIVISOR UNS			028435
	-		••		028440
1444					828445
niv:	PUSH	PSH	;	SAVE CALLER'S REGISTERS	Ø285Ø6
	PUSH	D	;		028508
	PUSH	н	;		928519
			;	LOOP COUNTER	628512
	MOV	A.B	;		928514
DIVØ:	MOV	B.A	;		928516
	MOV	A.C	;	ROTATE CARRY INTO CREG	@28518
	RAL		;	ROTATE NEXT HSB INTO CARRY	@2852@
	MOV	C.A	;		028522
	DCR		:		Ø28524
		_	;		\$28526
			:		Ø28528
			:		Ø2853Ø
		n	:	SHETRACT DIVISOR	828532
	7.00		1.5		Ø28534
					028536
					Ø28538
DIVI:		21.75	- 1		928549
	******	F.A	:		Ø28542
				COMPLEMENT QUOTIENT	928544
					Ø28546
	25000000				628548
					028550
			10.00		<b>828552</b>
	;***OUTPUT ;*** DIV: DIVI:	### B - DIV: PUSH PUSH PUSH MVI MOV DIVØ: MOV RAL MOV BCR JZ MOV RAL SUB JNC ADD JMP	### B - REMAINDER  DIV: PUSH PSH PUSH D PUSH H MVI E,9 MOV A,B MOV A,C RAL MOV C,A BCR E JZ DIVI MOV A,B RAL SUB B JNC DIVØ ADD D DIVØ  DIVI: RAL MOV E,A MVI A,BFFH XRA C MOV A,E	### B - REMAINDER  DIV: PUSH PSH PUSH D PUSH H MVI E,9 MOV A,B MOV A,C RAL MOV C,A BCR E JZ DIV1 MOV A,B RAL SUB B JNC DIVØ ADD B JMP DIVØ  DIV1: RAL MOV E,A MVI A,ØFFH XRA C MOV A,E	### B - REMAINDER  DIV: PUSH PSN

3996   E1							-	
SPAIL   FI	399F	E1			H	RESTORE CALLER'S REGISTERS		Ø28554
SPAZ   C9	39AØ	D1		POP	D	i		Ø28556
	39A1	F1		POP	PSW	;		@28558
	39A2	C9		RET		1		928569
			;					@28562
### ENDECD   IBINARY TO BCD (BB18-INTEL U.L.)   628986								
								THE SHARE
			****DHUUU			I I I ITUI-OIGGI GOO OT VONITO!		
				UNCTON				
### HL POINTS TO MSB IN LOWEST LOCATION								
\$4++   HL POINTS TO MSB IN LOWEST LOCATION   \$29386								
39A3   F5   BNBCD:   PUSH   PSH				-				
39A4 C5 PUSH B ; 929508 39A5 D5 PUSH B ; 929608 39A6 E5 PUSH H ; 9297608 39A7 EB XCHC G GET NUMBER INTO HL 929806 39A8 01F008 LXI B10000 ; GET MSD 92900 39A8 01F008 LXI B10000 ; GET MSD 930000 39A8 01F008 LXI B10000 ; GET MSD 930000 39A8 01F008 LXI B10000 ; GET MSD 930000 39A8 01F008 CXIL BECNO ; 930000 39B1 CXI B10000 ; 9300000 39B1 CXI B10000 ; 930000 39B1 F6300 CXI BECNO ; 930000 39B1 F6300 CXI BECNO ; 930000 39B1 F6300 CXI BECNO ; 9300000 39B1 F6300 CXI BECNO ; 93000000 39B1 F6300 CXI BECNO ; 9300000000000000000000000000000000000	0040		The state of the s					
39A5   D5			ENECD:					
39A6 E5 PUSH H ; G27700 39A7 EB XCHG								
39A7 EB XCHC	100000	77.7			-			
39A8 61F6DS	2000000				H	i		<b>@</b> 297@@
39AB CBC939 39AE 6118FC LXI B-1666	39A7	EB		XCHG		GET NUMBER INTO HL		029800
39AE #118FC LXI B,-168 ; #39188 39B1 CDC939 CALL DECNO ; #38288 378A #19CFF LXI B,-168 ; #38288 39B7 CDC939 CALL DECNO ; #38486 39B8 #1F6FF LXI B,-168 ; #38588 39B8 CDC939 CALL DECNO ; #38688 39B8 CDC939 CALL DECNO ; #38688 39C0 7D MOV A,L CET LSD #38768 39C0 7D MOV A,L CET LSD #38768 39C1 F638 ORI 30H FFOR ASCII #38758 39C3 12 STAX B STORE IT #38888 39C4 E1 POP H ; #38988 39C5 D1 POP D ; #38888 39C6 C1 POP B ; #381888 39C6 C1 POP B ; #381888 39C7 F1 POP PSM ; #381888 39C8 C9 RET ; #381888 39C8 C9 RET ; #381888 39C9 3E3Ø DECNO: MVI A,36H SAVE ADDR #31888 39C8 D5 DECNI: MOV E,L SAVE BINARY #31588 39CB D5 DECNI: MOV D,H ; #381888 39CC 3C INR A FINCREMENT DIGIT #31988 39CB 3C INR A FINCREMENT POINTER #32288 39CB 3C INR B FINCREMENT POINTER #322888 39CB 3C INR B FINCREMENT POINTER #322888	39A8	Ø1FØD8		LXI	B - 10000	ADDR INTO DE		829988
39E1 CDC939 39E4 019CFF 39E4 019CFF LXI B,-166 ; 39E309 39E7 CDC939 CALL DECNO ; 39E309 39E7 CDC939 CALL DECNO ; 39E309 39E8 01F6FF LXI B,-16 ; 39E80 CDC939 39E80 CDC939 39C8 7D MOV A,L CET LSD 39C87 39C1 F638 ORI 38H FFOR ASCII 638758 39C3 12 STAX D STORE IT 638888 39C4 E1 POP H 638888 39C4 E1 POP H 638888 39C5 D1 POP D 631688 39C6 C1 POP B 631688 39C7 F1 POP PSW ; 39C8 C9 RET 631288 39C9 3E38 DECNO: MVI A,38H 338H CONSTANT FOR ASCII, 6 FOR BCD 631588 39C8 D5 PUSH D SAVE ADDR 631688 39CC 5D DECN1: MOV E,L SAVE BINARY 631788 39CC 3C INR A FINCREMENT DIGIT 631888 39CF 89 DAD B SUBTRACT 632688 39DB DACC39 39DB DACC39 39DB DACC39 39DB DACC39 39DB DCR A SYES->RESTORE DIGIT COUNT 632688 39DB DACC39 39DB DCR A SYES->RESTORE DIGIT COUNT 632688 39DB DACC39 39DB DCR A SYES->RESTORE DIGIT COUNT 632688 39DB DACC39 39DB DCR A SYES->RESTORE DIGIT COUNT 632688 39DB D1 POP D SAND ADDRESS 632588 39DB C9 RET STAX D STORE DIGIT GUINT 632688 39DB C9 RET STAX D STORE DIGIT GUINT 632688 39DB C9 RET STORE DIGIT 632688	39AB	<b>CDC939</b>		CALL	DECNO	GET MSD		636666
3984 619CFF	39AE	@118FC		LXI	B,-1688	•		939198
3984 619CFF CDC939 CALL DECNO ; 638486 39BA 61F6FF LXI B,-16 ; 638586 39BB CDC939 CALL DECNO ; 638686 39C0 7D MOV A,L ; GCT LSD G38786 39C1 F638 ORI 38H ; FOR ASCII G38756 39C2 7E STAX B ; STORE IT G38886 39C4 E1 POP H ; 638986 39C5 D1 POP D ; 631686 39C6 C1 POP B ; 631686 39C6 C1 POP B ; 631686 39C7 F1 POP PSH ; 631286 39C8 C9 RET ; 631286 39C8 C9 RET ; 631286 39C9 3E38 DECNO: MVI A,38H ; 38H CONSTANT FOR ASCII, Ø FOR BCD G31588 39CB D5 PUSH D ; SAVE ADDR G31688 39CC 5D DECNI: MOV E,L ; SAVE BINARY G31788 39CB 3C INR A ; INCREMENT DIGIT G31986 39CF Ø9 DAD B ; SUBTRACT G31986 39DB DACC39 JC DECNI ; RESULT NEGATIVE G32686	39B1	CDC939		CALL	DECNO	•		939299
39BA 61F6FF LXI B,-10; 930506 39BD CDC939 CALL DECNO; 930606 39C0 7D MOV A,L GCET LSD 930706 39C1 F630 ORI 30H FFOR ASCII 930750 39C3 12 STAX D STORE IT 930800 39C4 E1 POP H; 930600 39C5 D1 POP D; 931100 39C7 F1 POP PSW; 931200 39C8 C9 RET; 9304 CONSTANT FOR ASCII, 6 FOR BCD 931500 39C9 3E30 DECNO: MVI A,30H F30H CONSTANT FOR ASCII, 6 FOR BCD 931500 39CB D5 PUSH D SAVE ADDR 931800 39CB D5 PUSH D SAVE ADDR 951800 39CB D5 PUSH D	3984	Ø19CFF		LXI	B168	;		030300
39BA 61F6FF LXI B,-10; 030506 39BD CDC939 CALL DECNO; 930606 39C0 7D MOV A,L GCET LSD 930706 39C1 F630 ORI 30H FFOR ASCII 930750 39C3 12 STAX D STORE IT 930806 39C4 E1 POP H; 930706 39C5 D1 POP D; 931100 39C6 C1 POP B; 931206 39C7 F1 POP PSW; 931206 39C8 C9 RET; 931206 39C8 C9 RET; 931206 39C9 3E30 DECNO: MVI A,30H 330H CONSTANT FOR ASCII, 6 FOR BCD 931506 39CC 5D DECNI: MOV E,L SAVE BINARY 931700 39CD 54 MOV D,H; 931206 39CE 3C INR A FINCREMENT DIGIT 931806 39CF 69 DAD B SUBTRACT 932066 39DF 69 DAC39 JC DECNI FRESULT NEGATIVE 9321606 39DB DACC39 JC	39B7	CDC939		CALL	DECNO			030406
39BD   CDC939   CALL   DECNO	39BA			-				
39C0   7D		and the same of th		-				
39C1 F630 ORI 30H FFOR ASCII 930F50 39C3 12 STAX D STORE IT 930800 39C4 E1 POP H G30900 39C5 DI POP D G31000 39C6 C1 POP B G31100 39C7 F1 POP PSW G31200 39C8 C9 RET G30H CONSTANT FOR ASCII, 6 FOR BCD 931300 39C9 3E30 DECNO: MVI A,30H G30H CONSTANT FOR ASCII, 6 FOR BCD 931500 39CB D5 PUSH D SAVE ADDR 931500 39CC 5D DECNI: MOV E,L SAVE BINARY 931700 39CD 54 MOV D,H G31800 39CE 3C INR A SINCREMENT DIGIT 931000 39CF 09 DAD B SUBTRACT 932000 39D6 DACC39 JC DECNI FRESULT NEGATIVE 932000 39D8 DACC39 JC DECNI FRESULT NEGATIVE 932100 39D8 DACC39 JC DECNI FRESULT NEGATIVE 932200 39D8 DACC39 JC								and the second second
39C3 12 STAX B STORE IT 938888 39C4 E1 POP H G 938988 39C5 D1 POP D G 931888 39C6 C1 POP B G 931188 39C7 F1 POP PSW G 931288 39C8 C9 RET G 9314 FOR BCD 931388 39C9 3E38 DECNO: MVI A,38H F38H CONSTANT FOR ASCII, 6 FOR BCD 931588 39CB D5 PUSH D SAVE ADDR 931688 39CB D5 PUSH D SAVE BINARY 931688 39CC 5D DECN1: MOV E,L SAVE BINARY 931788 39CB 3C INR A SINCREMENT DICIT 931888 39CE 3C INR A SINCREMENT DICIT 931988 39CF 69 DAD B SUBTRACT 932868 39D8 DACC39 JC DECN1 FRESULT NEGATIVE 932188 39D3 3D DCR A SYES>RESTORE DICIT COUNT 932286 39D4 6B MOV L,E BINARY MUNDER 932388 39D5 62 MOV H,D G STORE DICIT 932488 39D6 D1 POP D GAND ADDRESS 932588 39D7 12 STAX D STORE DICIT 932688 39D8 13 INX D STORE DICIT 932688					1220 T	ANTER TOTAL .		The state of the s
39C4 E1								
39C5 D1 POP D ; @31000 39C6 C1 POP B ; @31100 39C7 F1 POP PSW ; @31200 39C8 C9 RET ; @31300 39C9 3E30 DECNO: MVI A.30H ;30H CONSTANT FOR ASCII, Ø FOR BCD @31500 39CB D5 PUSH D ;SAVE ADDR @31600 39CC 5D DECN1: MOV E.L ;SAVE BINARY @31700 39CB 3C INR A ;INCREMENT DIGIT @31800 39CE 3C INR A ;INCREMENT DIGIT @31900 39CF Ø9 DAD B ;SUBTRACT @32000 39D0 DACC39 JC DECN1 ;RESULT NEGATIVE @32100 39D3 3D DCR A ;YES->RESTORE DIGIT COUNT @32200 39D4 6B MOV L.E ;BINARY NUMBER @32300 39D5 62 MOV H.D ; @32400 39D6 D1 POP D ;AND ADDRESS @32500 39D7 12 STAX D ;STORE DIGIT @32600 39D8 13 INX D ;INCREMENT POINTER @32700 39D9 C9 RET ; @32800					_			
39C6 C1 POP B ; Ø31100 39C7 F1 POP PSW ; Ø31200 39C8 C9 RET ; Ø31300 39C9 3E30 DECNO: MVI A.30H ;30H CONSTANT FOR ASCII, Ø FOR BCD Ø31500 39CB D5 PUSH D ;SAVE ADDR Ø31600 39CC 5D DECN1: MOV E.L ;SAVE BINARY Ø31700 39CD 54 MOV D.H ; Ø31800 39CE 3C INR A ;INCREMENT DIGIT Ø31900 39CF Ø9 DAD B ;SUBTRACT Ø32000 39DØ DACC39 JC DECN1 ;RESULT NECATIVE Ø32100 39DØ DACC39 JC DECN1 ;RESULT NECATIVE Ø32100 39D3 3D DCR A ;YES>RESTORE DIGIT COUNT Ø32200 39D4 6B MOV L.E ;BINARY NUMBER Ø32300 39D5 62 MOV H.D ; Ø32400 39D6 D1 POP D ;AND ADDRESS Ø32500 39D7 12 STAX D ;STORE DIGIT Ø32600 39D8 13 INX D ;INCREMENT POINTER Ø32700 39D9 C9 RET ; Ø32600			•					
39C7   F1					_			
39C8 C9 RET ; 931300 39C9 3E30 DECNO: MVI A,30H ;30H CONSTANT FOR ASCII, 0 FOR BCD 931500 39CB D5 PUSH D ;SAVE ADDR 931600 39CC 5D DECN1: MOV E,L ;SAVE BINARY 931700 39CD 54 MOV D,H ; 931800 39CE 3C INR A ;INCREMENT DIGIT 931900 39CF 09 DAD B ;SUBTRACT 932000 39D0 DACC39 JC DECN1 ;RESULT NECATIVE 932100 39D3 3D DCR A ;YES>RESTORE DIGIT COUNT 932200 39D4 6B MOV L,E ;BINARY NUMBER 932300 39D5 62 MOV H,D ; 932400 39D6 D1 POP D ;AND ADDRESS 932500 39D7 12 STAX D ;STORE DIGIT 932600 39D8 13 INX D ;INCREMENT POINTER 932700 39D9 C9 RET ; 932600					-			
39C9   3E30   DECNO:   MVI   A,30H   30H   CONSTANT FOR ASCII, 0 FOR BCD   031500   39CB   D5   PUSH   D					PSW			
39CB   D5		77.7				1		100.00
39CC   5D   DECN1: MOV   E+L   SAVE BINARY   631766			DECNU:					
39CD 54 MOV D.H ;					_			
39CE         3C         INR         A         ; INCREMENT DIGIT         631966           39CF         69         DAD         B         ; SUBTRACT         632066           39D6         DACC39         JC         DECN1         ; RESULT NECATIVE         632166           39D3         3D         DCR         A         ; YES>RESTORE DIGIT COUNT         632266           39D4         6B         MOV         L,E         ; BINARY NUMBER         632366           39D5         62         MOV         H,D         ;         632466           39D6         D1         POP         D         ; AND ADDRESS         632566           39D7         12         STAX         D         ; STORE DIGIT         632666           39D8         13         INX         D         ; INCREMENT POINTER         632766           39D9         C9         RET         ;         632666			DECN1:					
39CF         09         DAD         B         SUBTRACT         032000           39D0         DACC39         JC         DECN1         FRESULT NECATIVE         032100           39D3         3D         DCR         A         FYES>RESTORE DIGIT COUNT         032200           39D4         6B         MOV         L/E         FBINARY NUMBER         032300           39D5         62         MOV         H/D         FAND ADDRESS         032500           39D6         D1         POP         D         FAND ADDRESS         032500           39D7         12         STAX         D         FSTORE DIGIT         032600           39D8         13         INX         D         FINCREMENT POINTER         032700           39D9         C9         RET         F         032600								
39DØ         DACC39         JC         DECN1         FRESULT NEGATIVE         #32160           39D3         3D         DCR         A         TYES>RESTORE DIGIT COUNT         #32266           39D4         6B         MOV         L/E         #BINARY NUMBER         #32386           39D5         62         MOV         H/D         #4         #4           39D6         D1         POP         D         #AND ADDRESS         #32506           39D7         12         STAX         D         #STORE DIGIT         #32606           39D8         13         INX         D         #INCREMENT POINTER         #32706           39D9         C9         RET         #32806						The state of the s		
39D3 3D DCR A		-						
39D4         6B         MOV         L/E         ;BINARY NUMBER         632388           39D5         62         MOV         H/D         ;         632488           39D6         D1         POP         D         ;AND ADDRESS         632588           39D7         12         STAX         D         ;STORE DIGIT         632688           39D8         13         INX         D         ;INCREMENT POINTER         632788           39D9         C9         RET         ;         632888								
39D5         62         MOV         H,D         ;         632400           39D6         D1         POP         D         ;AND ADDRESS         632500           39D7         12         STAX         D         ;STORE DIGIT         632600           39D8         13         INX         D         ;INCREMENT POINTER         632700           39D9         C9         RET         ;         632800				-				
39D6         D1         POP         D         FAND ADDRESS         ### 32508           39D7         12         STAX         D         FSTORE DIGIT         ### 32608           39D8         13         INX         D         FINCREMENT POINTER         ### 32708           39D9         C9         RET         ### 32808						BINARY NUMBER		932399
39D7 12 STAX D   STORE DIGIT					H.D	;		832488
39D8 13 INX D ;INCREMENT POINTER 932788 39D9 C9 RET ; 932888	39D6	D1		POP	D	AND ADDRESS		032500
39D9 C9 RET 1 932800	3907	12		STAX	D	ISTORE DIGIT		032600
	3908	13		INX	D	INCREMENT POINTER		932788
	3989	C9		RET		1		832888
			;					932999

		1				033000
					**/ BIT COMPANE (OZ 124 CYC)	Ø331ØØ Ø332ØØ
		;***HILO	nr (	/ DFT THE	\$16-BIT COMPARE(EØ/2Ø SYS)	933200 933300
		inni INPUT:	-	6 BIT INTE		933488
		:***OUTPUT:			HL(DE) (ELSE)1	\$33568
		ittt			F/F'S, UNSIGNED NUMBERS ONLY	\$33600
39DA	<b>C</b> 5	HILO:	PUSH	B HAND	SAVE BC	033700
39DB	47	nito.	MOV	R.A	SAVE A RECISTER	Ø3380Ø
3900	23		INX	Н	INCREMENT HL BY ONE	033900
39DD	7C		MOV	A.H	WANT TO TEST FOR ZERO RESULT AFTER	034000
39DE	B5		ORA	L	:/INCREMENTING	934100
39DF	2B		DCX	H	RESTORE HL	034200
39EØ	37		STC		ISET CARRY	034300
39E1	CAE939		JZ	HILØ5	IF SO CARRY IS SET PROPERLY	834488
39E4	70		MOV	ALL	IF NOT MOVE L TO A	034500
39E5	93		SUB	E	SUBTRACT E	934699
39E6	7C		VOM	A.H	HOV H TO A	034700
39E7	9A		SEB	D	SUBTRACT D WITH BORROW	034899
39E8	3F		CMC		COMPLEMENT CARRY FOR OK CARRY BIT VA	LUE034900
39E9	73	HILØ5:	MOV	A.B	RESTORE A	Ø35000
39EA	C1		POP	B	RESTORE BC	035100
39EB	C9		RET		EXIT	035200
		•				035300
		•				035460
		1			CHARACTER CYNTHA OUTRUT	035500
		;***CLOOP			ICHARACTER STRING OUTPUT	035600
		;***INPUT:			CHARACTERS D LOWEST CHARACTER IN STRING	935799 935899
		;***OUTPUT:	100000000000000000000000000000000000000	WRITER OUT		Ø359ØØ
		;***		DESTROED	irui	935950
		;***		ESTROYED		Ø35952
		(***		ESTROYED		835954
39EC	<b>Ø</b> 5	CLOOP:	DCR	B	FFEED COUT UNTIL	036000
39EB	F8	CLUOI .	RH		LAST CHARACTER, THEN EXIT	036100
39EE	4E		MOV	C.M	GET CHAR	936200
39EF	CDF&39		CALL	COUT	TO OUTPUT ROUTINE	036300
39F2	23		INX	H	1	936499
39F3	C3EC39		JMP	CLOOP		936599
		;				036600
		1				936799
		1				636866
		;***COUT			CHARACTER OUTPUT (80/20 SYS )	936999
		: TUPHI ***		TE TO OUT		037000
		;***OUTPUT:		WRITER OUT	TPUT	837188
		;***		STROYED		037150
39F6	DBED	COUT:	IN	USTAT	CHECK READY	937200
39F8	E601		ANI	OK2GO	F STATUS UNTIL	037300
39FA	C2F639		JNZ	COUT	OK TO WRITE	937400
39FD	79 D3EC		VOM	A+C UPORT	SEND BYTE TO OUTPUT PORT	937599 937699
39FE	DIEC		out	UPUKI	וועט טורטו רטאו	B31000

3AØØ	C9		RET			637780
Unico	• /	;				Ø378Ø6
		i				837988
						938000
		;***OUTB			COUTPUT 1-BYTE INTEGERS	Ø381ØØ
		:***INPUT:	HI =A	(VALUES LIS		Ø3828Ø
		;***	1000	DDR (OUTPUT		038300
		;***			SYTES) OF LINE ENDING IN CR LF	Ø3835Ø
		:***OUTPUT		WRITER OUT		938400
3A01	7E	CUTB:	MOV	A.M	GET NEXT VALUE	Ø385ØØ
3AØZ	FE3B	00.5	CPI	1,1	i IF EQ '='	038600
3A94	CAIBSA		JZ	AGTUO	AGTUO OTOO	938799
3AØ7	E5		PUSH	H	SAVE A (VALUES) ON STACK	038800
3A98	D5		PUSH	n	ISAVE A(BUFFER) ON STACK	938900
3A89	EB		XCHC		THE NOW HAS A (BUFFER)	039000
SAGA	5F		MOY	E,A	ISETUP	939166
SAGE	AF		XRA	A	DE WITH	Ø39266
3ABC	57		MOV	D.A	VALUE	039300
SAGD	CDA339		CALL	BNBCD	CONVERT BIN TO ASCII	Ø394ØØ
3A1Ø	D1		POP	B	GET A(BUFFER) INTO D	039500
3A11	210600		LXI	H.Ø6H	BUMP BY 6 SLOTS	939699
3A14	19		DAD	B	TO NEXT FIELD	Ø397ØØ
3A15	EB		XCHG		AND PUT INTO DE	Ø398ØØ
3A16	E1		POP	H	GET A (VALUES) INTO HL	Ø399ØÐ
3A17	23		INX	H	BUMP TO NEXT VALUE	848888
3A18	C3Ø13A		JMP	OUTE	AND COTO NEXT VALUE	040100
3A1B	214639	GUTBA:	LXI	HALINE	OUTPUT	040366
3A1E	CDEC39		CALL	CLOOP	; LINE	948488
3A21	C9		RET		FEXIT	646566
		;				949699
		;				949799
		i				040800
3B8Ø			ORG	CLAS	ICLAS FILE DATA	949999
3888	Ø1	CI1:	BB	gib	ICLAS 1 ID	949919
3881	ØA		DB	10D		040920
3B82	<b>Ø</b> 5		DB	95D	•	040925
3883	<b>@</b> 3		DB	<b>83D</b>		040930
3884	14		DB	20D		949948
3B85	<b>8</b> 2		DB	<b>62B</b>		848945
3886	83		BB	690		949948
3B87	FF		DB	255D		048950
3888	ØA		DB	10D		640955
3889	67		DB	97D	1	040957
3B8A	62	C12:	DB	Ø2D	ICLAS 2 ID	841000
3B8B	28		DB	49D		941818
3880	68		DB	080		041012
3B8D	1B		DB	270		941914
3B8E	42		DB	66D		841828
3B8F	ØF CO		DB	150		041022
3B98	08		DB	g8D		841824
3B91	27		DB	390	•	041036

3892	20		DB	44D	;	841848
3B93	ØC		DB	12D		941942
3894	83	C13:	DB	Ø3D	ICLAS 3 ID	841168
3895	FD		DB	253D		941120
3896	<b>Ø</b> 3		DB	630		041122
3897	ØF		80	15D		941124
3898	17		DB	23D		041125
3B99	91		DB	145D		041140
3B9A	17		DB	23D		841142
3B9B	13		DB	19D		041144
					:	
3B9C	40		DB	77D		941160
3898	8C		08	128		841162
3B9E	<b>Ø</b> 5		DB	Ø5D	1	Ø41165
		!				941299
		!				041300
		i				841408
3000			ORC	FEAT	FEAT BLOCK DATA	941599
3D00	91	KN01:	DB	Ø1D	A PRIORI KNOWN AS 1-CLASS	941699
3DØ1	01	VEC1:	DB	Ø10	VECTOR NUMBER	841682
3DØ2	<b>Ø</b> 5		DE	Ø5D	;	041605
3DØ3	10		DB	16D	•	841687
3094	CS		DB	200D	;	941699
3005	02	KN02:	DB	Ø20	A PRIORI KNOWN AS 2 CLASS	941739
3006	82	VEC2:	30	Ø2D	VECTOR NUMBER	641702
3007	3C		DB	600		841784
3008	5A		90	980		841786
3009	50		DB .	80D		941768
3DØA	63	KN03:	DB	Ø3D	APRIORI KNOWN AS 3 CLASS	941800
3DØB	Ø3	VEC3:	DB	Ø3D	VECTOR NUMBER	941892
3DØC		AEC3.				
	CS		DE	200D		941989
3000	64		DB	1000	1	941982
3DØE	5A		DB	90D		941994
		!				942889
						842188
		i				842288
3F4Ø			ORG	PILE		942399
3F4Ø	6888		DW	ø		942499
3F42	8999		DW	9		942599
3F44	6966		DW	g	•	942699
3F46	6866		DM	4	i	842788
3F48	0000		DW	9	i	842888
3F4A	6888		DW	Ø	i	842988
3F4C	0000		DW	Ø	i	843888
3F4E	8888		DH	4		043100
3F5%	8888		DH	8	1	843288
3F52	8888		DW	9	•	943399
3F54	8388		DW	9		843488
3F56	6886		DW	9		843588
3F58	6006		DW	4		943699
3F5A	9999		DW	9		943799
3F5C	6666		DW	ě		943899
						2.0000

3F5E	0300	DW	g	i
3F60	8999	DW	Ø	i
3F62	0800	BW	g	i
3F64	0000	DW	g	;
3F66	8888	DW	g	;
3F68	9399	DW	g	;
3F6A	9999	DH	g	;
3F6C	9000	DW	g	;
3F6E	9393	DW	Ø	;
3F7Ø	6668	DW	g	i
3F72	0000	DW	9	;
3F74	6889	DW	g	;
3F76	8888	DW	9	;
3F78	6998	DW	g	;
3F7A	6300	DW	e	;
3F7C	0000	DW	Ø	;
3F7E	6888	DW	g	;
		END		i

NO PROGRAM ERRORS

SYMBOL TABLE

1 61							
A	8637	ACLI	3968	AFL	3958	AFLØ	395A
ANS	3955	В	8888	BNBCD	39A3	BPØ	3800 +
C	9991	CII	3B8@ *	CI2	3B8A +	C13	3B94 +
CLAS	3880	CLOOP	39EC	CODE	3800	COUT	39F6
D	0002	DATA	3940	DC4	38AØ	DECN1	39CC
DECNO	3909	DHØ1	396B	DHØ2	396C #	DHØ3	396D +
DHØ4	396E +	DH95	396F #	DHØE	3970 +	DHØ7	3971 +
DHØ8	3972 +	DH10	3973 *	DH11	3974 #	DH12	3975 +
DIV	397F	DIVE	3985	DIVI	3997	E	0003
EDEC	3956 1	EIC	0003	END	6663	ELB	8883
ESUM	396A #	FEAT	3000	H	8884	HILØ5	39E9
HILO	390A	I	395B	IC	395F	ICLAS	3962
IF7	38FØ	IKNO	3954	ING	3969	IOK	3968
IVEC	3957	J	395C	JD	395E	KN01	3DØØ #
KN02	3DØ5 +	KN03	3D0A *	L	9005	LB	3967
LINE	3949	LL	3953	H	9296	MND	3965
MXF	3963	NC2	3845	NF3	3869	NF3A	3888
NV1	3815	0A5	38B9	0A5A	38D5	OK2CO	6061
086	36DC	OUTB	3AØ1	OUTBA	3A1B	PILE	3F40
PSW	6036	SHØ1	3976	SHØ2	3977 +	SHØ3	3978 •
SHØ4	3979 +	SHØ5	397A 1	SHØ6	397B #	SHØ7	397C #
SHØ8	397D +	SHOP	397E #		9896	SP1	3945 +
SP2	394B +	SP3	3951 +	SP4	3952 4	STACK	3F8Ø
START	9999 +	SUBS	3980 +	UPORT	ØØEC	USTAT	BBED
VEC1	3001 4	VEC2	3006 +	VEC3	3D@B +		

STOP 13.744 CP SECONDS EXECUTION TIME :1038000031803F3E03325E393E033267393E033238 :103810005F39C3F03821533946043A673990FADCEE :1038200038702A5839237E325439237E3257392250 :103830005A3921803B2B226039215F397E325D3934 :103840003EFF326539215D397E3DFAB93877237EF6 :10385000325C392A6039237E3262392260392A5A31 :10386000392258393E00326339215C3935FAA038A3 :103870002A6039237E2356234E2260392A58392361 :1038800022583996F28838514FAF47CD7F3916000C :10389000592A6339CDDA39DA6938226339C369388C :1038A0002A6539EB2A6339CDDA39DA4538226539A8 :1038E0003A6239325539C3453821533911403906F6 :1038C00013CD013A3A5439215539BECAB538216948 :1038D0003934C3153821683934C31538217639063F :1038E00009CDEC392167391140390613CD013ACFAZ :1038F000AF326839326939AF325339216B39060B2F :0D390000CDEC3921003D2B225839C315387C :19397000494F4E539D0A53554D4D4152540D0AF5C2 :10398000D5E51E09784779174F1DCA9739781792E0 :10399000D2853982C38539175F3EFFA94F7B1FE16E :1039A000D1F1C9F5C5D5E5EB01F0D8CDC93901187C :1039B000FCCDC939019CFFCDC93901F6FFCDC9390C :1039C0007DF63012E1D1C1F1C93E30D55D543C09DC :1039D000DACC393D6B62D11213C9C547237CB52BB4 :1039E00037CAE9397D937C9A3F78C1C905F84ECD35 :1039F000F63923C3EC39DBEDE601C2F63979D3ECB5 :103A0000C97EFE3DCA1B3AE5D5EB5FAF57CDA33962 :103A1000D121060019EBE123C3013A214039CDEC55 :023A200039C9A2 :103B8000010A0503140209FF0A070228081B420F55 :0F3B900098272C0C03FD030F179117134D0C057D :0F3D0000010105100802023C5A500303C8545A5F :0000000000

APPENDIX K
Sample Execution Output

COMMAND- XCR9D,USER

CREATE ENTER OPTIONS #LIH1

ENTER PARAMETERS LABL, NBUF, JD, IC, NI, NE, MXV \*1000.0100.14.03.50.00.020

APPROVE ADJUSTED PARAMETERS OPTS LABLINEUF, JD. ICINI, NEIMXV LIH1 1000 100 14 3 50 0 80 ENTER Y OR N

CREATE ENTER OPTIONS

.. COPYSEF LOCF

APPROVE ADJUSTED PARAMETERS OPTS LABLINEUFIJBIICINIINEIMXV LIH1 1606 160 14 3 56 1 88

38.

36.

29. 32.

25.

FEAT FILE HAS 1360 WORDS AND 80 VECTORS PER BLOCK DIST FILE HAS 812 WORDS AND 50 STEPS PER HISTOGRAM STOP 5.306 CP SECONDS EXECUTION TIME

ENTER Y OR N FEAT FILE HAS 1360 WORDS AND 80 VECTORS PER BLOCK DIST FILE HAS 812 WORDS AND SØ STEPS PER HISTOGRAM FIRST PASS SCAN STATISTICS .LIM: .500E-02 .919E+00 CSDL CSDR COMPONENT NUM AV MIN MAX HODE WHODE .471E+03 .228E+03 .327E+03 0. .471E+03 .331E+03 .394E+03 0. .539E+00 .726E+00 6. 1= .461E+00 .919E+00 0. 2= .471E+03 .314E+02 .118E+03 0. .134E+00 .604E+00 0. .471E+83 .282E+03 .362E+03 0. .264E+00 .888E+00 B. 4= .471E+03 .358E+02 .119E+03 0. .471E+03 .256E+01 .301E+02 0. 5= .920E-01 .677E+00 B. .500E-02 .251E+00 0. 6= .471E+63 .528E+61 .449E+62 6. .228E-81 .374E+86 8. 7= .471E+83 .691E+82 .178E+83 8. .148E+08 .464E+08 8. 9= .471E+63 .588E+01 .453E+02 0. .100E-01 .306E+00 6. .471E+03 .609E+02 .167E+03 0. .471E+63 .883E+01 .667E+02 0. 18= .103E+00 .459E+00 0. .530E-01 .357E+00 0. 11= .471E+03 .950E+01 .612E+02 0. .380E-01 .339E+00 D. .471E+03 .156E+02 .806E+02 0. .471E+03 .150E+02 .772E+02 0. .730E-01 .399E+00 6. 13= 14= .448E-81 .402E+88 6. HISTOGRAM FILE OPEN HISC 1888 58 14 HISC RECORD 1 1 0 0 50 CSDL CSDR MAX MODE COMPONENT NUM MIN 1= .471E+03 .139E+01 .981E+00 .388E+02 .539E+06 .726E+00 .709E+00 .410E+00 0. 1. 0. 1. 1. 8. 0. 0. ø. 8. 8. 6. 6. 2. 0. 0. 5. 19. 37. 63. 6. 0. 1. 1. 0. CSDR MAX MODE COMPONENT NUM AV CSDL MIN VMODE 2= .471E+03 .167E+01 .118E+01 .488E+82 .461E+88 .919E+00 .892E+00 .193E+00 1. 1. 8. 8. 8. Ø. Ø. 9. ø. ø. 8. 6. 0. 1. 8. . . Ø. 6. 1. 8. 8. 0. 1. 1. 1. 91.

58.

51. 64.

COMMAND- XDE9D, FEAT, NEWS

DEFINE ENTER MODE AND OPTIONS

FEAT FILE 1888
CLAS FILE 188881
NEXT-CLASS
ENTER FUNCTION AND CLASS ID
AAAA.H.+NN
+KS 81

SET HUSK VECTOR A, NV, NV,...(15) 4A,023,034

NEXT-CLASS
ENTER FUNCTION AND CLASS ID
AAAA.H.+NN
#KS #1

SET HUSK VECTOR A, NV, NV,...(15) \*A,083

NEXT-CLASS
ENTER FUNCTION AND CLASS ID
AAAA,+,+NN
\*DEFN.H, #1

NEXT-CLASS
ENTER FUNCTION AND CLASS ID
AAAA.H.+NN
#REFN.H, #2

NEXT-CLASS
ENTER FUNCTION AND CLASS ID
AAAA+++NN
\*OUIT

COMMAND- XDE9D, FEAT

DEFINE ENTER MODE AND OPTIONS

1.96

FEAT FILE 1888
INITIAL CLAS FILE 18881
ENTER PARAMETERS
NB,NE,HUSKR

STOP 1.973 CP SECONDS EXECUTION TIME

K-3

## COMMAND- COPYSBF , LOCF

1 PL DEFINE ENTER MODE AND OPTIONS OFENED FEATURE FILE WITH HEADER NAME , LABL , JD , LB , IC , MV , IOPT , IHIS , FIRS , FLAS FEAT 1000 17 80 3 198 5 1 .50E-02 .92E+00 INITIAL CLAS FILE 188881 ENTER PARAMETERS NE, NE, HUSKR 59 9 .0919 APPROVE ADJUSTED PARAMETERS NB, NE, MAXRV, CLAS FILE SIZE 50 1 0 CLAS DEFN FOR 1 SYM= 1 .672E+80 .778E+80 .298E+80 .788E+80 .314E+80 .917E-81 .125E+80 .341E+80 .129E+80 .322E+80 .162E+80 .166E+80 .282E+80 .198E+80 .999E+99 .316E-81 .616E-81 .712E-81 .853E-81 .115E+88 .339E-81 .458E-81 .559E-81 .559E-81 .115E+80 .339E-81 .458E-81 .559E-81 .562E-81 .593E-81 .458E-81 .559E-81 .562E-81 .593E-81 .458E-81 .559E-81 .562E-81 .593E-81 .445E-01 .561E-01 .638E-01 .669E-01 .999E+99 HISTOGRAM FILE OPEN HISC 100001 58 14 HISC RECORD 1 1 30 21 50 CLAS DEFN FOR 2 SYM= 1 .715E+00 .884E+00 .211E+00 .825E+00 .197E+00 .359E-01 .623E-01 .408E+00 .629E-01 .379E+00 .104E+00 .105E+00 .145E+00 .137E+00 .999E+99 .635E-02 .2152-01 .217E-01 .497E-01 .869E-01 .146E-61 .282E-61 .355E-61 .433E-61 .444E-61 .269E-61 .409E-61 .426E-61 .611E-61 .999E+99 .635E-62 .215E-61 .217E-61 .47E-61 .889E-61 .146E-61 .282E-61 .365E-61 .433E-61 .444E-61 .269E-61 .499E-61 .426E-61 .611E-61 .999E+99 2 1 30 21 50 HISC RECORD CLAS DEFN FOR 3 SYM= 1 .709E+00 .876E+00 .227E+00 .809E+00 .211E+00 .470E-01 .783E-01 .405E+00 .770E-01 .379E+00 .105E+00 .104E+00 .151E+00 .140E+00 .999E+99 .130E-01 .316E-01 .343E-01 .569E-01 .835E-01 .186E-01 .315E-01 .390E-01 .443E-01 .451E-01 .292E-01 .435E-01 .498E-01 .598E-01 .999E+99 .130E-01 .316E-01 .343E-01 .369E-01 .835E-01 .186E-01 .315E-01 .390E-01 .443E-01 .451E-01 .292E-01 .435E-01 .498E-01 .598E-01 .999E+99

Sent Selection of the S

CLAS VECTOR TACS

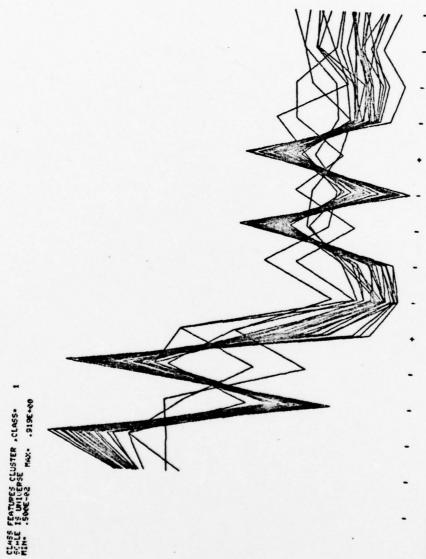
CLAS VECTOR TACS

119 11 279 21 21 379 317 98/4 99/4 1/3 1/2 6/6 6/6

119 11 276 40 .3012 40 .3012 40 .40145 1

110 11 276 2 CDU CLAS - 1

2.672240 .778240 .278240 .278240 .788240 .314240 .917241 .125540 .341240 .125640 .322240 .322240 .425240 .778240 .778240 .278240 .778240



0

FEATURE COMPONENTS

## COMMAND- XTR9B FEAT INEWC

TRYOUT
ENTER OPTIONS
\*PNFSL

FEAT FILE 1000
CLAS FILE 100001
SUBSET
ENTER CLASS AND DIMENSIONS
+CL
1008

1LOG FIGURES OF MERIT FOR DIMENSIONS
6=.1920E+02 7=.1562E+02 1=.1546E+02 11=.1498E+02 9=.1364E+02 12=.1282E+02 8=.1199E+02 3=.1128E+02
10=.1112E+02 13=.1065E+02 2=.9852E+01 14=.9692E+01 4=.8223E+01 5=.6761E+01
2SUM FIGURES OF MERIT FOR DIMENSIONS
6=.1186E+07 1=.4927E+06 7=.1974E+06 11=.1784E+06 3=.7843E+05 9=.7090E+05 12=.6069E+05 13=.3495E+05
8=.2434E+05 2=.2278E+05 14=.1852E+05 10=.1674E+05 4=.3880E+04 5=.3748E+04
ENTER F/M SET NUMBER
+2

SUMMARY CONCLUSION
.6582 .3418 0.8080
SUBSPACE TAGS
6 1 7 11 3 9 12 13 8 2 14 10 4 5
SUBSPACE ERROR RATES
1=59/40 2=62/37 3=61/38 4=65/34 5=66/33 6=64/35 7=66/33 8=66/33 9=65/34 10=68/31 11=66/33 12=66/33
13=65/34 14=65/34
SUBSET
ENTER CLASS AND DIMENSIONS
+CL
#099

DB,DB,...

ENTER F/M SET NUMBER

SUMMARY CONCLUSION
.7134 .2866 0.0000
SUBSPACE TACS
6 1 7 11 3 9 12 13 8 2 14 10 4 5
SUBSPACE ERROR RATES
1=59/40 2=61/38 3=61/38 4=61/38 5=61/38 6=61/38 7=61/38 8=61/38 9=61/38 10=71/20 11=71/20 12=71/20 13=71/20 14=71/20 SUBSET
ENTER CLASS AND DIMENSIONS
+CL

COPYSBF , LOCF

COMMAND-

```
OPENED FEATURE FILE WITH HEADER
NAME , LABL , JD. LB , IC , MV , IOPT , IHIS , FIRS , FLAS
FEAT 1000 17 80 3 198 5 1 .56E-02 .92E+00
OPENED CLAS FILE WITH HEADER
                                            MKV NENT NCIX MSCAL MZAPD
 NAME LABLE JDX ICX NTC MBUC
 CLAS 100001
                             3 56
                                             6
                                                   17
                17
                      14
                                                           6
CLAS FILE INDEX
1= 1 2-1, 2= 3 4-1, 3= 5 6-1,
 1 CLASS MERIT= VMAC= .17E+03
 .884E+02 .339E+02 .384E+02 .197E+02 .133E+02 .888E+02 .489E+02 .295E+02 .349E+02 .258E+02
 .467E+02 .329E+02 .276E+02 .221E+02
CLASS 1 AS SEEN BY REST VMAG= .17E+03
 .942E+02 .154E+02 .739E+01 .116E+02 .377E+01 .934E+02 .368E+02 .198E+02 .236E+02 .151E+02
 .235E+02 .140E+02 .421E+01 .420E+01
  REST AS SEEN BY CLASS 1 VMAG= .15E+83
 .894E+82 .349E+82 .394E+82 .207E+82 .143E+82 .898E+82 .499E+82 .365E+82 .359E+62 .268E+82 .477E+82 .339E+82 .286E+82 .231E+82
 2 CLASS MERIT= VMAG= .36E+#3
 .211E+03 .976E+02 .674E+02 .471E+02 .236E+02 .174E+03 .949E+02 .511E+02 .673E+02 .442E+02 .893E+02 .626E+02 .518E+02 .415E+02
CLASS 2 AS SEEN BY REST VMAG= .19E+03
 .522E+03 .300E+03 .159E+02 .372E+02 .189E+01 .568E+03 .126E+03 .359E+02 .534E+02 .226E+02
 .962E+02 .414E+02 .238E+02 .128E+02
  REST AS SEEN BY CLASS 2 VMAG= .85E+83
.123E+83 .646E+82 .298E+82 .274E+82 .103E+82 .856E+82 .468E+82 .216E+82 .324E+82 .183E+82 .426E+82 .298E+82 .242E+82 .195E+82
 3 CLASS MERIT= VMAC= .58E+03
 .256E+03 .100E+03 .136E+03 .540E+02 .490E+02 .329E+03 .181E+03 .881E+02 .128E+03 .782E+02
 .177E+03 .123E+03 .102E+03 .828E+02
 CLASS 3 AS SEEN BY REST VMAG= .25E+03
 .387E+02 .151E+01 .249E+03 .317E+01 .445E+02 .151E+04 .483E+03 .837E+02 .245E+03 .729E+02
 .520E+03 .234E+03 .154E+03 .111E+03
  REST AS SEEN BY CLASS 3 VMAG= .17E+04
 .450E+02 .104E+02 .687E+02 .684E+01 .253E+02 .154E+03 .860E+02 .370E+02 .609E+02 .340E+02 .878E+02 .602E+02 .506E+02 .412E+02
 SUMMARY CONCLUSION
 .6582 .3418 0.0009
 CONFUSION MATRIX
 198 1 86 1 12
  82 2 9 47 42
 191 3 24 23 52
```

HISC RECORD 3 1 30 21 50 CLAS VECTOR TAGS 1/0 1/1 2/0 2/1 3/0 3/1 98/# 99/# 0/0 0/0 0/0 0/0 1 CAV CLAS= 1 .672E+00 .778E+00 .290E+00 .708E+00 .314E+00 .917E-01 .125E+00 .341E+00 .129E+00 .322E+00 .162E+00 .166E+00 .202E+00 .198E+00 AT VEC= 2 CSDL CLAS= 1 .316E-01 .616E-01 .712E-01 .853E-01 .115E+00 .339E-01 .458E-01 .559E-01 .562E-01 .593E-01 .445E-01 .561E-01 .638E-01 .689E-01 3 CAV CLAS= 2 AT VEC= .715E+00 .884E+00 .211E+00 .825E+00 .197E+00 .359E-01 .623E-01 .408E+00 .629E-01 .379E+00 .104E+00 .105E+00 .145E+00 .137E+00 AT VEC= 4 CSDL CLAS= 2 .635E-02 .215E-01 .217E-01 .497E-01 .869E-01 .146E-01 .282E-01 .365E-01 .433E-01 .444E-01 .269E-01 .409E-01 .426E-01 .611E-01 AT VEC: 5 CAV CLAS: 3 .709E+00 .876E+00 .227E+00 .809E+00 .211E+00 .470E-01 .783E-01 .405E+00 .770E-01 .379E+00 .165E+60 .194E+00 .151E+00 .149E+00 6 CSDL CLAS= 3 AT VEC= .130E-01 .316E-01 .343E-01 .569E-01 .835E-01 .186E-01 .315E-01 .390E-01 .443E-01 .451E-01 .292E-01 .495E-01 .498E-01 .598E-01 AT VEC= 7 CLAS= 98 .539E+00 .461E+00 .134E+00 .264E+00 .920E-01 .500E-02 .220E-01 .140E+00 .100E-01 .103E+00 .530E-01 .380E-01 .730E-01 .440E-01 AT VEC= 8 CLAS= 99 .726E+00 .919E+00 .604E+00 .888E+00 .677E+00 .251E+00 .374E+00 .464E+00 .306E+00 .459E+00 .357E+00 .399E+00 .492E+00 LIST.IX FROM 1 OF 17 11\*\*\*\*\*\* 1100 1201 2100 2201 3100 3201 98000 99000 . 6 7 8 9 10 2 12 13 14 15 16

.. XFR9E , FEAT , NEWC

FORMAT
ENTER FILE AND FUNCTION

FX

ENTER XMIT PARAMETERS
AAAA
\*D000

FEAT FILE 1000 CLAS FILE 100001 NEXT-RECORD NN= RECORD-ID #01

SELECT CLASS= 1 RB= 1
PICK VECTORS FROM 1 TO 80
K,VVV,VVV,...(15)
+C,001,009

PICK VECTORS FROM 2 TO 80 K, VVV, VVV, ... (15) #C.010

PICK VECTORS FROM 11 TO 80 K,VVV,VVV,...(15)

XMIT OUTPUT 14 DIMENSIONS
STOP
.136 CP SECONDS EXECUTION TIME
.REWIND.BYTE
COPYSEF.BYTE

:10D000000101C7EF44D25A4931A951A1455E4761DB
:10D010000102C1B866B5464F489C52B25F5E958A0B
:10D020000102937E94899A927966A0718498B1AE52
:10D030000104AB9344AB77815DA17D925C6D58639F
:10D040000105D9CF3FC049494AB862B444F444D0D
:10D050000106F6CE25E11A351CDD74D0373D2C2E12
:10D060000107BBAC42CD5E6F42B874B35572B4B7L
:10D070000108EB7B93EC53C4E3AB53D88524F58580D
:10D080000109CAC95996D158726ADE476AC9AFC85D
:10D08000010AF2D73CD1583432B950AB3F574D616E
:10D0800001FF

FREIL, FEAT, NEWC

FORTHT
ENTER FILE AND FUNCTION

1CX

ENTER XMIT PARAMETERS
AAAA

1C360

CLAS FILE 100001
NEXT-RECORD
NN- RECORD-ID
100

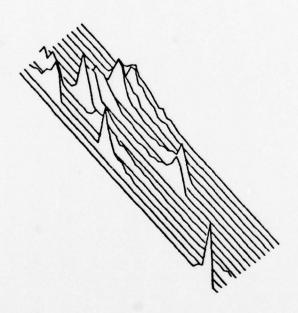
XMIT OUTPUT 14 DIMENSIONS
STOP
.144 CP SECONDS EXECUTION TIME
..REWIND, BYTE
..COPYSEF, BYTE

:100000007528288122225526268523236132325A85
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:1002000256026141420626600691101414038
:1000400011020255056141420626600661101414038
:100040001102025505614183111321212DF171718
:10006000342424281313281616011819262660682
:100000001F

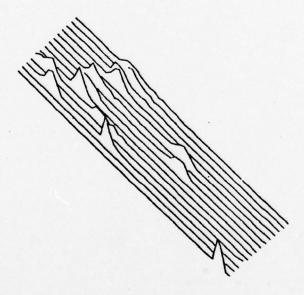
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HIST CLASS. 3 ENTER SCALE CONTROLS BB.E.22.2.EL. \$10.6.40.0.70.

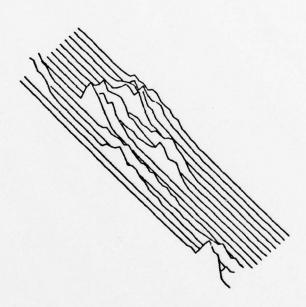
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HIST CLASS. 2 ENTER SCALE CONTROLS EE.F.ZZ.Z.EL. \$10.0,40.0,70.



HIST CLASS 1 ENTEP SCALE CONTROLS FB.F,22.2,EL. \$10.0,40.0,70.



APPENDIX L

Alphabet Classification Experiments

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APPENDIX M
Support and Utility Subroutines

	f	1 VECTOR
		NEW 6 55 # 1 1 2
DIMENSION LIST(NENT,2)  NUM=LADD  If (LADD,GT.8) GOTO 18  NUM=3  LIST(1,1)=3  LIST(1,2)=2	LIST(2,1)=9999999 LIST(2,2)=1 CONTINUE BD 5 I=NUM,NENT LIST(1,1)=0 LIST(1,2)=1+1 CONTINUE	(1,1)= 3 (1,2)= 2 (2,1)= 999999 (2,2)= 1 (3,1)= 8 (3,2)= 4 (4,1)= 8 (4,2)= 5 (5,1)= 6 (5,2)= 6 (5,1)= 6 (5,2)= 6 CLASS FILE HAS NENT + 1 VECTOR
69768=0 69988=0 76888= 78188= 78288=	76583-16 76583-16 76583- 76583- 76583- 77583- 77583-	71288-0+ 71288-0+ 71588-0+ 71588-0+ 71588-0+ 71588-0+ 71588-0+ 71588-0+
SUBROUTINE INITC(NENT-LISTIANDD)  THIS SUBMODULE INITIALIZES AN EMPTY INDEX FOR THE CLAS VECTORS FILE. THIS FILE USES A LINKED LIST OF USED AND UNUSED VECTORS AS INDEX TO THE POSITION OF THE PROTOTYPE DESTINATIONS FOR FACE OF STATE OF THE PROTOTYPE RETAINTAND	ENTRY POSITION WITHIN THIS LIST> VECTOR POSITION WITHIN THE FILE PLUS TWO "MAME" ENTRY IN THE LIST IS A STRUCTURED KET WHERE NAME> IC+1000+KTFP, AND IC-LASS ID WUNDER, KTFP-VECTOR TYPE IC-LASS ID WUNDER, KTFP-VECTOR TYPE	KITP=100> CAV, CLASS MEAN VECTOR =201> CSDL, DEVIATION VECTOR (LEFT) =202> CSDR, " " " (RIGHT) =30N> KER, HUSK VECTOR (N=1,MAXKE/JDX) POINTER TO TOP OF USED VECTOR CHAIN IS LIST(1,1) KAME INDEX ENTRY IS LIST(1,1) LIKK INDEX POINTER IS LIST(1,1) VECTOR POSITION IS AT LIST(1,2) WHOSE NAME APPEARS AT LIST(1,1) NOTE THAT CHAINS ARE NOT CIRCULAR
66888= 67888=C++ 67189=C++ 6738=C++ 6738=C++	######################################	**************************************

0

SUBROUTINE DEL (NAME, LIST, NENT, NPOS, IEDJ) DELETES VECTORS FROM CLAS FILE LINK AROUND DELETED ENTRY LIST(LA1,2)=LIST(NA1,2) RESET NEXT UNUSED POINTER IF(LIST(NAI,1).CT.NAME) COTO 2 IF(LIST(NAI,1).CT.NAME) COTO 4 FOLLOW THE NAME KEY CHAIN RETURN NO SUCH NAME ERROR CONTINUE IF NOT YET IN BETWEEN HOOK INTO UNUSED CHAIN LIST(MAI, 2) = IU ASSUMED DONE BY CALLER COMMON/TRACE/ILOG,ITRACE DIMENSION LIST(NENT,2) DELETE NAME ENTRY CLEAR THE RECORD NORMAL EXIT NAI=LIST(NAI,2) LIST (NAI, 1) = @ LIST(1,1)=NAI NAI=LIST(1,2) TU=LIST(1,1) KAI=NAI-2 CONTINUE NPOS=KAI CONTINUE CONTINUE CONTINUE COTO 3 IEO-B IE0J=3 RETURN LAI=NAI COTO 1 COTO 5 LAI=1 78488=C+\* 78588= 78688= 77666=C## 77168= 77288= 77388= 77488=C\*\* 78766= 78866=C\*\* 78966= 2 79488=C++ 79588= 3 7980G=C++ 88188=C++ 88288= 5 77528= 1 778@@=C++ ##J=##88/ 78288=C++ 79362=C++ 19990= 4 76588=C 76788= -89611 78399= 77668= =80182 -89964 =88891 =8869 79000= 79100= 79200= -88161 =888888 SET NEW ENTRY PTR TO NEXT ENTRY (NAI) LIST(IU,2)-LIST(LAI,2) Set previous entry ptr to new entry SUBROUTINE ADD(NAME,LIST,NENT,NPOS,1EOJ)
COMMON/TRACE/ILOG,1TRACE ADDS VECTORS TO THE CLAS FILE UPDATE NEXT UNUSED POINTER ERROR EXIT --> NO MORE ROOM 1 WRITE(ITRACE,957)NPOS, IEOJ.LA1
FORMAT(7H ADD ,514)
RETURN SETUP NEW VECTOR NUMBER FOLLOW POINTER CHAIN IF (LIST (NAI,1), LE.NAME) GOTO 2 ELSE INSERT NAME IF (ILOC.NE. B. AND. ILOG. LE. 2) IF NOT IN-BETWEEN DIKENSION LIST (NENT , 2) IF (TU. CT. NENT) COTO 4 NORMAL EXIT LIST(1,1)=LIST(10,2) NAI=LIST (NAI,2) LIST (IU, 1) = NAME LIST(LAI,2)=IU NAI=LIST(1,2) 1U=LIST(1,1) KAI=10-2 GOTO 3 CONTINUE CONTINUE CONTINUE CONTINUE (POS=KAI LAI=NAI COTO 5 IE0J=2 GOTO 1 IEOJ=0 LAI=1 76000= 957 76100= 76200= 76300= 74988=C\*\* 75888= 3 75500= 4 75688=C++ 75788= 5 73566= 73566=C++ 73766= 74866=C++ 74308= 74458= 2 73288= C++ 4288=C++ 72788=044 3468=044 3888=044 13968= -90944 5288= 74168= -8883 =8887/ -8662 73188= 72488= 72688=

NEXYE-8 CALL RIX(NAME, CLAS(1,NCIX), NENT, NPOS, IEDJ) IF(IEDJ, GT.8) 60TO 46 BURP ENTRY NUMBER AND GET KVEC IFINENCE BLUCLAS) COTO 20 INITIALIZE ON FIRST CALL FOR CLASS IF(ILOGURE.8.AND.ILOG.LE.2)
1 WRITE(ITRACE.957) NPOS.IEOJ
FORMAT(7H KGET ,315) OBTAIN NEW KERVEC POSITION COMMON/TRACE/ILOG,ITRACE INTEGER CLAS(JDX,1) IF INEXNE. GT. JD) GOTO 10 IF (KV.CT.MAXKV) GOTO 38 NAME=NAME+1 KVEC-6LASINEXE,NPOS)
KERGET-KVEC
IF (KVEC.GT.Ø) COTO 5Ø
COT LAST ENTRY DATA LCLAS, NEXKE/8,97 GOTO SØ NO SUCH KERVEC CONTINUE EXIT ROUTINE NAME = NEXC+1000+300 NEXKE=NEXKE+1 KERGET=-1 LCLAS=8 CONTINUE CONTINUE JD=JD1-3 KERGET=8 CONTINUE CONTINUE MEXKE-8 KV=KV+1 IEDJ=5 1E0.0=0 97900= 957 90000= 98100= 95588= 95688= 95888=**C\*\*** 959**8**6= **28** 97158=C++ 97258= 48 97688= 58 97788= 94688= 94788=C## 97488= 97588=C## 95188= 19 PERENCH. 94828= 95229= 95488= 96188= 96188= 96288= 96388= 96488= =86396 96988= 97888= 94188= 94480= 3870B= 17388=

SUBROUTINE RIX (NAME, LIST, MENT, NPOS, IEOJ)
DIMENSION LIST(NENT, 2)
RETURNS POSITION OF NAMED VECTOR

IF(LIST(NAI,1),CT.NAME) COTO 4 IF(LIST(NAI,1),LT.NAME) COTO 2 NPOS-NAI-2

88566= 1

-99788

NAI=LIST(1,2)

\$\$166=C\*\* \$\$166=C\*\* \$\$265= \$\$365=

FUNCTION KERGET(CLAS, JUX, NETC, IEDJ)
COMMON/KFILE/ MAXKV, NCIX, NENT, MSCAL, MZAPD

COTO 5 NAI=LIST(NAI,2)

C070 1

NO SUCH VECTOR ERROR CONTINUE

EXIT ROUTINE CONTINUE

RETURN END

1503=3

SCALE PROTOS ONCE AT START OF PROCESS
CALL XSCAL(CLAS(1,NCMIN), CLAS(1,NCMX), CLAS(1,NCAV), JD, SCALE, 1)
CALL XSCAL(CLAS(1,NCMIN), CLAS(1,NCMX), CLAS(1,NCSDL), JD, SCALE, 2) CALL XSCAL (CLAS(1)NCMIN), CLAS(1,NCMAX), CLAS(1,NCSDR), JD, SCALE, 2) IF ((SCALE(1), CT.1.0.AND. ILOG.EQ.3).OR. TRACE-DUNP SCALED CLAS FILE 1 (ILOG.EQ.1.OR.ILOG.EG.2))
2 CALL PRCLAS(CLAS,CLAS,JDX.ICX) I (N. (LCID(N.K), K=1,3), N=1,NTC) IF (ILOC.NE.8) WRITE (ILOCF,988) FORMAT (17H CLAS FILE INDEX! 1 ((( 6(12,1H=,313,1H,) ))) ) IF (NCSDR.LT.8) GOTO 198 NORKAL EXIT ERROR EXIT CONTINUE CONTINUE CONTINUE IEOJ=8 17695= 166 8268= 268 8288= 988 17988= 388 17886=0++ 18189=C++ 18768=C## 18888= =89981 18368= -90531 18666= 7586= =88681 COMMON/NAMES/INPF, IOUTF, IFEAT, IOLDC, INENC, ILOGF, IHISC COMMON/CONX/LCID(51.3),SCALE(2),ICONF,ANS(3),IMAG DIMENSION CLAS(JDX,1) CALL RIX (98888, CLAS (1, NCIX), NENT, LCID (51,1), 1EOJ) CALL RIX (99808, CLAS (1, NCIX), NENT, LCID(S1, 2), IEOJ) SET UP POINTERS TABLE TO DRIVE PROGRAM SAVES TIME ON MULTIPLE PASSES THRU CLAS CALL RIX (NAMC, CLAS (1, NCIX), NENT, LCID (N, 1), 1EOJ) CALL RIX(NAML, CLAS(1,NCIX), NENT, LCID(N, 2), IEDJ) CALL RIX(NAMR, CLAS(1, NCIX), NENT, LCID(N, 3), 1EOJ) COMMON/KFILE/HAXKV, NCIX, NENT, MSCAL, MZAPD SUBROUTINE INDEX (CLAS, JDX, ICX, IEDJ) FINDS MIN, MAX VECTORS IF (SCALE(1), LE. 1.8) COTO 188 IF (IEDJ. GT. 8) LCID (N. 3) =-1 COMMON/TRACE/11.00, ITRACE IF (IEOJ.CT. 8) COTO 266 IF (IEOJ. GT. 8) GOTO 266 IF (IEOJ.CT.8) COTO 266 IF (IEOJ.CT.8) COTO 288 CLASS VECTORS COMMON/CNUM/NEXC, NTC NCMAX=LCID(51,2) NCKIN-LCID(51,1) (CSDR=LCID(N+3) NCSDL=LCID(N,2) WANC=N=1868+188 NAMR-N+1668+262 NAML = N+1666+261 (CAV-LCID (N, 1) DO 188 N=1,NTC JD=JDX-3 14788=C++ 14928=C\*\* 15988=C\*\* 15168= 15268= 1558= 1548= 1558= 1558= 1576=0+ 1586= 14488= 14188= 15986= -82891 16188= 16388= 16488= 16588= 16688=

COMMON/NAMES/INPF, IOUTF, IFEAT, IOLDC, INEWC, ILOCF, IHISC COMMON/NAMES/INPF, 10UTF, IFEAT, 10LDC, INEWC, 1LOSF, IHISC COMMON/PARAM/MEMC. MEM. NHX, JDX, ICX, NCI.NLI, NBI, IC IF (ILOC. CT. 8) WRITE (ILOCF, 988) NAME, LABLH, NBUC, JD FORMAT (21H HISTOGRAM FILE OPEN, 2X, 84, 1X, 18, READ (IOLDC) ((CLAS(J,I), J=1,JDX), I=1,ICX) WAITE (IOUTF, 900) NAME, LABLH, NBUC, JD IX, IIH BUCKETS= ,13,6H DIMS=,13) OPENS HISTOGRAM FILES SUBROUTINE LOADC (CLAS, JDX, ICX, IEGJ) READ(IHISC)NAME, LABLH, NHX, JD, IDUM SUBROUTINE OPENHICLABLH, IEOJ) COMMON/TRACE/ILOG, ITRACE JDX=JD+3 IF (NAME.NE.NAMK) IEOJ=2 RETURN DIMENSION CLAS (JDX, 1) LOAD CLAS FILES DIMENSION IDUN(6) DATA NAMEN/4HHISC/ REWIND THISC NEUC-NHX-S RETURN END 119988= 988 119388=0++ 87288= 87388=C## -005611 118766= 18968= -89961 119188= 119266= 119508= 126006= 119688= 119766= 119883= 120100= -838871 37600a 87488= 87580= 87166= MRITE (ILOGF, 982) NGO, NENT, (LIST(I), I=11, I2), (LIST(I), I=NI, NZ) FORMAT( 15H LIST.IX FROM ,16,4H OF ,16/(((2016/2016/))) ) WRITE(ILOGE,983)1,KTFP(IP),CLAK(JD+3,1),(CLAS(J,I),J=1,JD) FORMAT(2X,9H AT VEC= ,14,1X,A4,7H CLAS= ,13/. FORMAT (15H HUSK VECTOR= ,13,3H AT.13,12H FOR CLASS ,13, WRITE(ILCCT:981)CLAK(UD+2:1),1,CLAK(UDX:1),CLAK(UD+1:1), COMMON/NAMES/INPF,IOUTF,IFEAT,IOLDC,INEWC,ILOGF,IHISC COMMON/MFILE/MAXKV,NCIX,NENT,MSCAL,MZAPD FORMAT(17H CLAS VECTOR TACS/((( 28(14,1H/:11) ))) ) INTEGER CLAK(JDX,1),LIST(1),CLAS(JDX,1),KTYP(4) WRITE(ILOGE,988) (CLAK(JDX,I),CLAK(J1,I),I=1,IX) 6H WITH ,13,18H ENTRIES //(((3814))) ) KTYP (-- JD+2, NEXC (-- JDX, NEXKE <-- JD+1 SUBROUTINE PRCLAS(CLAK, LIST, CLAS, JDX) IF (CLAK (JD+2, I) . LE. 2) 60T0 18 PRINT VECTOR TAGS IF ICLAK (JDX, I) . LE. 6) GOTO 15 PRINT CLAS FILE PRINT VECTORS PRINT LIST. IX IF (LIST (N) .EQ. 8) GOTO 21 PRINT HUSKS DO 28 N=NLISI +NLIS2 , 28 ((((18(11, 69.3))))) 1 (CLAK(J,1),J=1,JD) COMMON/CNUM/NEXC,NTC NLIS2=NLIS1+NENT+28 IP=CLAK (JD+2,1)+1 NLIS1=1+IX+JDX VCD=N-NL1S1+1 XI 1=1 SI 00 12=11+28-1 II=II+NENT NZ=1Z+NENT IX=NCIX-1 CONTINUE CONTINUE D=JDX-3 COTO 15 CONTINUE J-101-16 RETURN 124188= 982 124288= 28 121980= 981 22758= 983 121186= 988 22386= 18 22988= 15 20688=C++ 121200=C## 121568=044 21686-044 22268=C++ 23663=C++ 24386= 21 121488= -82277 121708= -88177 22538= 22680= 120700= 126960= 121366= 231.68= 23368= 23463= 23688= 124588= 23588= 23780= 23888= 239662 -268877 -80797 -89882 21000=

```
WRITE(IOUTE,983) LABLC
FORMAT(12H CLAS FILE ,17)
IF(ILOG.NE.B)NRITE(ILOGF,981)LABLC,MJDX,MICX,MTC,MBUC,MXV,MENT,
                                                                                                                                                                                                                                          FILE LABLES: FEAT-->AANN, CLAS-->AANNIX
IE IS SET 10 2.9,4,5 WHEN OLDC USED IN FORMAT
IF (IE.EG.9.AND.LADLF.NE.LABLC/165888) COTO 55
IF (IE.EG.1.OR.IMOD.EG.IHI) COTO 76
                                                       READ (IOLDC) NAME, LABLC, MJDX, MICX, MTC, MBUC, MKV, MENT,
                                                                                                                                                                                     JDX ICX NTC NB, NENT NCIX MSCAL MZAPD/
INITIALIZE OLD CLAS FILE IF REQUIRED
                                                                                                                                                                  FORMAT(18H CLAS FILE HEADER/
                                                                          1 MCIX,MSCAL,MZAPD
                                                                                                                                                 1 MCIX, MSCAL, MZAPD
                                                                                                                                                                                     34H CLAS
35H MAXKU
                  CONTINUE
REWIND TOLDC
                                                                                                                                                                                                                          2X,16171
                                                                                                                                                                                                                                                                                                                                                        NBUC=MBUC
                                                                                                                                                                                                                                                                                                                                        MAXKV=XKV
                                                                                                                                                                                                                                                                                                                                                                                           NENT = MENT
                                                                                                                                                                                                                                                                                                                    XOCH-XOC
                                                                                                                                                                                                                                                                                                                                                                             VCIX=KIJN
                                                                                                                                                                                                                                                                                                                                                                                                                ICX=MICX
                                                                                                                                                                                                                                                                                                                                                                                                                                    NTC=NTC
                                                                                                             93988 983
94828 981
94288 981
94388 9458
                                                                                                                                                                                                                                           94588=
95888=
95888=
95888=
95888=
95888=
95888=
93388=C+++
                 13480= 35
                                                     93688=
93788=
93888=
                                                                                                                                                                                                                                                                                                                                                                                                              95588=
95688=
95788=
                                                                                                                                                                                                                                                                                                                                    IF (ILOC.NE.8) WRITE (ILOGF, 988) NAME, LABLF, JDX, LB, IC, MAXV, IOPT,
                                                     COMMON/NAMES/INPF, ICUTF, IFEAT, IOLDC, INEWC, ILOCF, IHISC
                                                                                                                                                                                                                                                                                                                                                                     FORMPIOSH OFENED FEATURE FILE WITH HEADER / 1 52H NAMELASE, UB. LB.IC. MV.10PT.1HIS. FIRS. 2 2KAG.IXIG.IXIZ.IXIZ.IXIZ.4XII.4XII.2E8.2) IF(IMOD.EG.IHI) GOTO 78
                                                                                          COMMON/PARAM/MENC, MEM, NHX, JDX, ICX, NC1, NL1, NH1, IC
                                                                                                                              COMPON/DIST/FIRS.FLAS.FIRC.FLAC.MBUC.KTR.NI
COMMON/TRACE/ILGS.ITRACE
DATA IMI.HC.IMF/IMI.HC.1MF/
                                                                                                                                                                                                                                                             READ (IFEAT) NAME, LABLF, JDX, LB, IC, MAXV, IOPT,
                  SUBROUTINE OPENX(IMOD.IE, LABLC, LABLF, IEOJ)
                                                                     COMMON/KFILE/MAXKV, NCIX, NENT, MSCAL, MZAPD
                                                                                                                                                                                                        IF(IE.CT.2) GOTO 35
OPEN FEAT FILE AND LOG ITS ID RECORD
                                                                                                                                                                                     BYPASS FEATURE FILE IF NOT REQUIRED
                                                                                                              COMMON/CREC/LASV, IEOFR, NBPR, LB, MAXV
                                                                                                                                                                                                                                                                                                                    FORMATILZH FEAT FILE , IT)
                                                                                                                                                                                                                                                                                                    WRITE(10UTF, 982) LABLF
                                       COMMON/CNUM/NEXC,NTC
                                                                                                                                                                                                                                                                                 I HIS, FIRS, FLAS
                                                                                                                                                                                                                                                                                                                                                             I INIS,FIRS,FLAS
                                                                                                                                                                                                                                             REMIND IFEAT
                                                                                                                                                                                                                                                                                                                                                                           92988 988
                                                                                                                                                                                     91960=C+++
                                                                                                                                                                                                                                                                                                                        92688- 982
                                                                                                                                                                                                                              92166=C##
                                                                                                                                                                                                       -92026
                                                                                                                                                                                                                                                                                                    -88226
                                                                                                                                                                                                                                                                                                                                       32708=
                                                                                                                                                                                                                                                                                                                                                             92888=
                                                                                                                                 -01716
                                                                                                                                                                    -03816
                                                                                                                                                                                                                                                                                    -92426
                                       91166=
91288=
91388=
91466=
91568=
```

NORMAL EXIT

CONTINUE

RETURN

ERROR EXIT

CONTINUE

IE03=4

95988=C## 96838= 55 96188= 96288=C##

MEMC=JDX+ICX

37 0703

15800=

```
EACH FEAT RECORD HAS JD+2 ENTRY NEC AT LAST VEC
                                                                                                                                                                                                                                                                                                                                                                                        IF(ILOG.NE.8.AND.ILOG.LE.2)
1 WANTE(ITRACE,957)1E0FR,LASV,IE0J,NBPR,LASC,NEXC FORMAT(8H RFEAT ,315)
                                                                                   READ(IFEAT)(IFEAT(J-L),J-L-JDX),L=1,LB)
NEIC MUST MATCH BLOCK DATA
IF(IABS(FEAT(JD+2,L)),LT,NEXC) 60T0 5
COUNT BLOCKS FOR THIS CLAS
                                                                                                                                                  IF(IABS(FEAT(JD+2,1)).EQ.NEXC) COTO 18
NO SUCH FEATURE CLASS
                                                                                                                                                                                                                         READ(IFEAT)((FEAT(J.L),J=1,JDX),L=1,2)
6010 38
                                                                                                                                                                                                                                                                                      IF (FEAT (JD+2,L), GT.8) COTO 28
                                                                                                                                                                                                  READ TRAILER RECORD
            CONTINUE
IF(IEOFR.CT.Ø)NBPR=Ø
JD=JDX-3
PROCESS THIS CLASS
                                                                                                                                                                                                                                                                                                                                                                 EXIT
                                                                                                                                                                                                                                                                          DO 28 L=1,LB
                                                                                                                                   NBPR=NBPR+1
                                                                         CONTINUE
                                                                                                                                                                                                                                                                                                               LASC=NEXC
                                                 IEDFR=8
                                                                                                                                                                                                             CONTINUE
                                                                                                                                                                                                                                                                                                                                                   CONTINUE
                                                                                                                                                                                                                                                                                                                                                                           CONTINUE
                                                                                                                                                                                    COTO 38
                                                                                                                                                                                                                                                              CONTINUE
                                                             LASV=LB
                                                                                                                                                                                                                                                                                                                                      G0T0 38
                                                                                                                                                                                                                                                                                                                            IEOFR-1
                                                                                                                                                                          IE0J=2
                                                                                                                                                                                                                                                                                                  LASV=L
                                                                       46888= 5
46980=
47888=C**
47188=
                                                                                                                                                                         4756=
47756=
47716=C+
47729=
6
47730=
47745=
                                                                                                                                                                                                                                                 47950=C##
47918= 18
                                                                                                                                   47300=
47460=
47560=€**
         46388= 4
46388=
46588=
46588=
46788=
                                                                                                                                                                                                                                                                                                                                                   87 = 3898
                                                                                                                                                                                                                                                                                                                                                                           88 #88 38
                                                                                                                         17286=C++
                                                                                                                                                                                                                                                                                                                                                               $$766=C*#
                                                                                                                                                                                                                                                                          =9003
                                                                                                                                                                                                                                                                                      48198=
                                                                                                                                                                                                                                                                                                                                                                                        =99685
                                                                                                                                                                                                                                                                                                                                                                                                   -90065
                                                                                                                                                                                                                                                                                                                                      48588=
                           SUBROUTINE REFATIFEAT.JDX.INIT.IEDJ)
COMMONYRANES/INPF.IDUTF.IFEAT.IOLDC.INENC.ILOGF.IHISC
COMMON/TRACE/ILOG.ITRACE
COMMON/TOW/NEXC.NTC
                                                                                                                                                                                                                                                                              READS NEXT FEAT BLOCK FOR OPTED CLASS=NEXC FINDS FIRST FEAT BLOCK OF NEXT CLASS=NEXC
                                                                                                                                                                                 IF (INIT.NE.1) COTO 2
RESET FEAT FILE BEFORE FIRST BLOCK
                                                                              COMMUNICAEC/ LASV, IEOFR, NEPR, LB, MAXV INTEGER FEAT (JDX, 1), IDUX(14)
                                                                                                                                                                                                                                                                                                                   IF (NEXC.NE.LASC.OR.LASC.EQ.8) GOTO 4
RESET TO REPEAT THIS CLASS
                                                                                                      IF(INIT.ED.2) COTO 6
IF(ICO.ED.1) COTO 1
NEFR-#
                                                                                                                                                                                                                                                                                                                                            DO 3 N=1.NBPR
BACKSPACE IFEAT
CONTINUE
NBPR=8
LASC=8
                                                                                                                                                                                                                                                         READ (IFEAT) IDUM
                                                                                                                                                                                                         REWIND IFEAT
                                                                                                                                                                                                                                                                                                         CONTINUE
                                                                                                                                                                      CONTINUE
                                                                                                                                                                                                                                                                      G010 3#
                                                                                                                                            LASC=8
                                                                                                                                                                                                                                              B=IINI
                                                                                                                                                                                                                       NBPR=8
                                                                                                                                                                                                                                   LASC=8
                                                                                                                                                           1:03
                                                                                                                                                                                                                     44588=
44588=
45888=
45188=
45288=
                                                                                                                                                                                 44588=C++
                                                                                                                                                                                                                                                                                                                                  45688=C++
45788=
45886=
45988= 3
                                                                                                                                                                                                                                                                                               15568=(**
                                                                                                                                                                                                                                                                                                         45488= 2
       15586=
                                                                                                                                                                                                         14668=
```

19106= 957

SUBROUTINE XSCAL(FMIN.FMAX,VEC.MN.SCALE,IOP) DIMENSION VECINN),SCALE(2),FMIN(NN),FMAX(NN) IF (10P.EQ.1) VEC(N)=((VEC(N)-A)/D)\*SCALE(1)
IF (10P.EQ.2)VEC(N)=((VEC(N)/D))\*SCALE(1)
VEC(N)=IFIX(VEC(N))
CONTINUE SCALES NEG TO POS RANGE NN 15 N=1 , NN A-FRIN(N) B=FYAX (N) D=8-8+E RETURN 38588 = 18 38588 = 18 39588 = 18 39188 = 18 39588 = 18 38188= 38188= 38288= 38488= 38488= READ(IHISC)INEXC.ISYM.KTR.NI.NBUG.((HISC(N.J).N=I.NHX).J=1.JB) IF(INEXC.LI.NEXC) GOTO 5 IF(INEXC.GI.NEXC) GOTO 88 IF (ILUG. EQ. 1) WRITE (ITAACE, 957) NEXC. INEXC.NTC. ISYM.KTR.NI.NB. COMMON/NAMES/INPF.IOUTF.IFEAT.IOLDC.INEWC.ILOGF.IHISC END OF FILE DEFINE-OUTPUT ENDS AT NTC RECORDS READS AND LOCS HISTOGRAM RECORDS IF(ILOG.GT.8) WRITE(ILOGF.998) NEXC.ISTM.NB WRITE(IOUTF.988) NEXC.ISTM.NB FORMAT(Z6H LOADED HIST RECORD FOR 13/ 12H WITH SYM: 11,13H INTERVALS: 13) COMMON/HREC/ISYH, KTR, LABLH, NI, NEUC, JD SUBROUTINE RHIST (HISC, NHX, IEQJ) COMMON/TRACE/ILOG.ITRACE NORMAL EXIT IF INEXC. CT. NTC) GOTO 75 ERROR EXIT FORMAT (SH RHIST ,914) DIMENSION HISC (NHX, 1) CONKUN/CNUM/NEXC, NTC IF (15 TM. EQ. 2) NB=NI CONTINUE CONTINUE CONTINUE CONTINUE 1E0.1=-9 60T0 85 NE-NBUC IE07=1 RETURN 117168= 117268= 117358=C\*\*\* 117488=C\*\*\* 117588= 75 117808=C+++ 17668= 988 18268= 957 1443-03991 18168=C+++ 116168= 5 116288= 116388= 116488= 18266= 85 17966= 88 16688= 19888= 15588= 15658= 15988= 16566= 16766= 16836= 16966= 117688= -891111 18228= 18255=

SUBROUTINE WRHIS(HISC.NEXC.ISYM.LABLC.NBUC.KTR.NI.NHX.JDX) COMMON/MAMES/INPF.100JF.1FEAT.10LDC.INEWC.1LOGF.1HISC WRITES HISC FILE WITH HISC REC FOR THIS CLASS IF (ISW.Eq.1) GOTO 18 IF (ILOG.NE.B) WRITE (ILOGF, 988) NEXC, ISYM, KTR, NI, NBUC IF(ILOG.NE.Ø)URITE(ILOGF.902) NAME.LABLC.NHX.JD FDRMAT(21H HISTOCKAM FILE OPEN,2X,44,18,215) WRITE (THISC) NAME, LABLC, NHX, JD, IDUM PRINT STATISTICS AND HISTOGRAM COMMON/TRACE/ILOG,ITRACE DIMENSION HISC(NHX,1),IDUM(6) FORMAT(12H HISC RECORD, 516) WRITE HISTOGRAM RECORD J, (HISCIN, J), N=NI, NZ), IF (ILDG.NE.2) COTO 168 IF (ISYM.EQ.1) COTO 28 IF (1.EQ.1) K2=KTR-1 IF(1.NE.2) GOTO 28 DATA NAME/4HHISC/ WRITE (ILOCF, 981) MYSI,1=1 981 00 DO 36 J=1,JD JD=JDX-3 N2=KTR+7 K1=KTR+8 CONTINUE CONTINUE NI=KTR KZ=NHX K2=NHX N2=8 6=1X 15888= 988 15286= 962 117958= 117188= 28 117118= 15500= 10 115488=0+4 14800=0## 15666=Cx# 15388= 15726= 117288= 117386= 117468= 115100= 16036= 16166= 16388= 116500= 116688= 16888= 14638= 14908= 15866= 15988= 16288= =88591 14368= 14560= FORMAT(17H WROTE CLAS FILE /8H LABEL= ,19,7H ,S/Z= ,213) WRITE(IFIL) NAME, LABLC, JOX, ICX, NTC, NBUC, MAXKV, NENT, NCIX COMMON/NAMES/INPF, IOUTF, IFEAT, IOLDC, INENC, ILOGF, IHISC FORMAT(17H NEWS VECTOR TAGS/(((12(1X,14,1H/,14)))) WRITE(IOUTE,983) LABLC,MSCAL,MZAPD IF(ILOC.GE.2)WRITE(ILOGE,980)LABLC,JDX,ICK,NTC, COMMON/DIST/FIRS, FLAS, FIRC, FLAC, NBUC, KTR, NI WRITE(IFIL) ((CLAS(J,I),J=1,JDX),I=1,ICX) SUBROUTINE WRCLAS(CLAS, JDX, ICX, IS, LABLC) COMMON/KFILE/MAXKU, NCIX, NENT, MSCAL, MZAPB 1 NEUC, MAXKV, NENT, NCIX, MSCAL, MZAPD ((CLAS(J,1),J=JJ,JDX),I=1,II) FORMAT(18H NEWC FILE HEADER/ IF (ILOC. CE. 2) WRITE (ILOGF, 981) WHAT PACKING IS USEFUL? FILE HEADER RECORD COMMON/TRACE/ILOG, ITRACE IF (IS.EQ.1) IFIL=10LDC COMMON/CNUM/NEXC, NTC INTEGER CLAS(JDX,1) MENT X DATA NAME/AHCLAS/ I ,MSCAL,MZAFD MAXKV IFIL-INENC 3 2X,1817) 1=NC1X-1 ו-אמר-יר 63816= 983 164138= 968 ##3=8254E 83688=6## -9966691 184208= -23776 -828281 -626161 84388= -83468--34768--63/50 -806181

WRITE (IHISC) NEXC, ISYM, KTR, NI, NBUC, ((HISC (N, J), N=1, NHX), J=1, JD)

\* 2X4HCSDR,7X3HMIN,7X3HMAX,6X4HMODE,5X5HVNODE/

1 IXI2,2H= ,8(1XE9.3)/ 2 ((( 28(1XF5.8))) )

CONTINUE

118665= 36 118165= 168 118268= 268

-898311

FORMAT (38H COMPONENT NUM

17660= 961

17566=

=002211

(HISC (K, J), K=K1, K2)

FT(4) MUST BE INIT AT & FOR EACH STREAM FHIS(FT(4)) MUST BE LT FHIS(K) ON FIRST ENTRY FT(4) + 1 -->POINTS TO BUCKET CONTAINING MODE (MBUC) SUBROUTINE STATHILAS,FIN,FT,FHIS,NI,FIRS,FLAS)
COMPUTES HISTOGRAM AND MODE VALUES
FIN-->INFUT VALUE (VECTOR COMPONENTISEE CDEFI)
NI-->NO. BUCKETS IN HISTOGRAM (SEE CDEFI)
FRIS-->HISTOGRAM ARRAY COMPUTE MODE AND PERCENTAGE ON LAST CALL FIRS--YLOWER LIMIT OF WALUE RANGE
FLAS--YUPPER LIMIT OF WALUE RANGE
FT(1)--YOUNT OF INPUT WALUES (SEE STATX)
FT(2)--YAVERAGE INPUT WALUE (SEE STATX) FT(8) -- > MODE COUNT AS PERCENT OF FT(1) (SEE STATX) IF (FHIS (K). GT. FHIS (LAST)) FT (4) =K-1 (SEE STATY) FT(7) = STEP # FLOAT (I-1) + STEP / 2. + F1RS STEP = (FLAS-FIRS) /FLOAT (NI) FT(5)-->MINIMUM VALUE FT(6)-->MAXINUM VALUE IF (FIN.LT.BECIN) COTO 149 DIMENSION FT(8), FHIS(NI) NORMAL EXIT FT (7) -- >MODE VALUE FT (3) -- )VARIANCE IF (LAS. EQ. 1) GOTO 15# FT(8) =FHIS(1)/FT(1) FHIS (K) = FHIS (K) +1. BECIN-BECIN+STEP DO 138 N=1+NI LAST=FT(4)+1. I=FT(4)+1.@ BEGIN=FIRS CONTINUE **6010 168** CONTINUE CONTINUE RETURN 65368= 138 65488= 148 65588= 66328= 168 66328= 168 54875= 158 63688=C++ 63988=C\*\* 64288=C## 84268=C++ 54408=C++ ##3=9L699 333@=C++ \$3586=C## 64090=0++ \$43@@=C+# 53488=C++ 64188=C++ 65688= 65788=C 33268=C 3=88839 66388= -68949 64618= -69139 -80859 -83549 65888= 65188= 65288= 12988= =85899 COMPUTES STATISTICS (S-SET, U-USE, +-SET/USED, #-SCR) FT HOLDS SCRATCH VALUES AND EXTRA RESULTS
FT(1),FT(2),FT(3),FT(4),FT(5),FT(6),FT(7),FT(8) INITIALIZE TEMPORARIES ON FIRST INPUT SUBROUTINE STATX (LAS, FIN, FT, CAV, CSD, ISW) COMPUTE ASSYMETRIC DEVIATION IF(ISW.EQ.Ø) CAV=FT(3)/FT(1) IF(ISW.EQ.Ø) T=ADS(FT(2)/FT(1) - CAV\*\*2) COUNT NUMBER OF INPUT VALUES SET CAV, CSD ON LAST CALL COMPUTE STANDARD DEVIATION CSD MEUC MIN MAX RESETS CAV ONLY WHEN ISH --> ZERO CLEARS MBUC COUNTER FOR STATH IF (FIN.LT.FT(S)) FT(S)=FIN COMPUTE MIN, MAX F(15W.EQ.1) T=FT(2)/FT(1) IF (FIN. CT. FT (6) ) FT (6) =FIN FT (2) =FT (2)+(FIN-CAV) ##2 F (FT(1) .NE.8.) GOTO 18 COMPUTE NEAN NORMAL EXIT F(T.LT.1E-12) T=1E-12 IF (LAS. EQ. 1) GOTO 25 F(15W.NE.8) COTO 28 FT(2)=FT(2)+FIN++2 DIMENSION FT (8) FT(3)=FT(3)+FIN FT(1)=FT(1)+1. FT (6) =- 1E+19 FT (5) = 1E+18 SD=SGRT(T) CONTINUE FT(4)=8. CONTINUE CONTINUE CONTINUE COTO 38 50TO 38 RETURN 68588= 68588= 68588= 68688= 18 62158=C 62288= 28 68988=C++ 62410=C++ 2428= 25 \$2586-C++ 36 = 38972 3-9876 59368=C 59468=C 59698=C 59798=C 59888=C 3-88889 3-88565 3-32219 61688=C 61788= 62888= 59198= -31939 62108= -63269 61668= 51488= 52388= 52438= 52425= 61200= 62438= 52468= \$2478=

00 928 KK-1, ICRID, 2 891 OT 09 8# J=K1 1=1 50 38 166 6768= 6788= 6788= 6788= 6888= 68186= 68288= 68388= -02269 68598= 68398= 68398= 69396= 69396= 69166= 69266= 69366= 69460= 76168= 76368= 76488= 76588= 76588= 68488= =88769 -88889 -88869 -28889 -9980 -9868 71838= 11198= 1200= 1388= 1460= \*\*\* MR RAY SPALDING....
\*\*\* MODIFIED FOR TEKTRONIX 4914 5/78 - JRL\*\*\*
MODULE PLOTSD PLOTS A THREE-DIMENSIONAL SURFACE AS \*\*\*COURTEST OF LT R ROACH, AFIT/ENT . ORIGINAL SOURCE \*\*\*FROM GEORGIA TECH OFFICE OF COMPUTING SERVICES, BT A TRO-DIMENSIONAL PROJECTION ON A CALCOMP PLOTTER.
THE SURFACE IS ROTATED 45 DEGREES IN I-J PLANE BEFORE ANGLE OF OBSERVER FROM HORIZONTAL, IN DEGREES REVISE PLI, AND COMMENTED CALL TO "WHERE" FOR CALCOMP TWO-DIMENSIONALARRAY CONTAINING Z-VALUES TENTRONIX VERSION ASSUMES CALL INITT IS EXTERNAL BSCALE: LINES PER INCH IN I AND J DIRECTIONS COMMON/PLSD/BSCALE, ZSCALE, ELEV, ICPS, IGRID HID MUST HAVE (IMAX+JMAX) +2 FREE ENTRIES PLOTTING. ALL HIDDEN LINES ARE REMOVED. DEFINITIONS OF ARCUMENTS: UNITS PER INCH IN 2 DIRECTION SUBROUTINE PLOT3D(FCN2D, HID, IMAX, JMAX) ZSIZE=COS(ELEV\*. #17453292519) /ZSCALE PLX REPLACES CALL TO CALCONP 'PLOT' 1SIZE=XSIZE+SIN(ELEV+. 017453292519) SECOND DIMENSION OF FCN2D DIMENSION FCNZD(IMAX, JMAX), HID(2) FIRST DIMENSION OF FCN2D ISIZE-RIANDJ. 78718678119/BSCALE GRID: 3--> CRID, 2-->STRIPS .. USE IT WITH CARE ELSENHERE CALL WHERE (YPAGE, YPAGE, HID) 16 ZMIN-AMINI (ZMIN, FCNZD(I, J)) CALL PLX (XPAGE, YPAGE, -3) DATA ZCON/6HZ\*\*\*\*/
IF (IGRID.NE.3) IGRID=2 REAL HID, HLASTM, HLAST HID(1)=-36. #HID(1) DO 926 J=1, JMAX IANDJ=IMAI+JMAX DO 927 I=1, IMAX RIANDJ-IANDJ-2 N03Z=N1WZ 927 CONTINUE ZSCALE: ELEV: A 57289= 926 CONTINUE FCN2D: IMAX: MAX: 3=88629 63588= 63688= 63788=C 3-838ES 64288=C 543E8=C 3=88+16 3=895b 3-83819 3-83119 3-88959 3-88/15 3-6881 3=9964 3-888S 3-8865 6390g=C 5188=C 3=80SS 2689=C 3-88/S 5888=C -93119 -53399 63488= -92199 -602799 -8889° -88899 -8319 -88599

11# XINC=(XPAGE+(YLAST-HLAST)+XLAST+(HLASTM-YPAGE))/(HLASTM-HLAST-PAGE=YSIZE+FLOAT(IMAX-I+J-1)/RIANDJ+ZSIZE+(FCNZD(I+J)-ZMIN) YINC=(HLASTM#YLAST-HLAST\*YPAGE)/(HLASTM-HLAST-YPAGE+YLAST) (PAGE=XSIZE\*FLOAT (I+J-2) /RIANDJ (F (HID (16K) - YPACE) 118,118,178 IF (YPAGE-HLASTM) 188,128,128 IF(IFEN.EQ.3) GO TO 210 IF CINC. NE.K) GO TO 118 IF (K.EG.1) GO TO 68 IF (K.EQ.1) GO TO 38 68 I=K2 78 IF(K.EQ.1) GO TO 88 GK=IMAX+JMAX+I+J YPAGE+YLAST) DO 929 I=2, IANDJ ALASTM=HID(IPJ) 28 HID(1)=HID(1) HLAST=HLASTM 98 XLAST=XPACE YLAST = YPACE KIF=IMAX 929 CONTINUE KZF=JMAX 30 10 40 87 OT 03 50 10 96 KZ=IMAX KZF=1 K=KK-2 K1=JMAX [PJ=[+] IPEN=3 INC=-K 46 KII=KI KIF=1 K2=1 J=K2

EMULATES CALCOMP 'PLOT' ROUTINE X:Y ARE INPUT AND OUTPUT VARIABLES, NB! IF(II.EB.2) CALL DRWABS(IX.IY)
IF(II.EB.3) CALL MOVABS(IX.IY) SUBROUTINE PLX (X, Y, 11) IF (II. WE. -3) RETURN IY=188+Y X+991=XI X=Ø. RETURN END 76888= 76139=C+++ 76268=C+++ 76388= 76488= 76588= 76588= 76588= 7698= 77888= 771888= CO TO 218 IF(K1.EQ.K11) CO TO 218 IF(K1.NE.K11+1NC) GO TO 158 23¢ CALL PLX(6.6.6.6.-3) 928 CONTINUE RETURN END KINC=XLAST TINC=YLAST CO TO 163 INC=-INC CO TO 58 KII=KI 71880- 128 71980- 128 71980-72280-72280-72280-72280-72280-72280-72280-72280-72280-72280-72280-72280-72280-= 75188= 75288= 75588= 75588= 75588= 75588= 75688= 75688= 73089= 73186= 73286= 73466= 73506= 73506=

M-13

IF (YLAST-HID(IQK)) 138,158,158

IPEN=2

HID(IPJ)=IPACE IF(IPEN.EG.2) GO TO 158 IF(INC.EG.K) GO TO 148

IF (K1.EQ.K17) GO TO 218 IF (K1.EQ.K17) GO TO 138

IGK-IKAX+JMAX+1

```
DECODE CHAR ADDRESS TO HEX
                                                                                                                                                                                                                                                                                                                                                                                                                   INSERT CHECK SUM INTO LINE
                                                                                                                                                                                                                                                                                                                                 F (ICL.CT.15.0R.1CR.CT.15) COTO 759
                                                                                                                                                                                                          LOOP ENCODES 16 BYTES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         LAST LINE PROCESS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      KCR=15- (KR- (KR/16)+16) + 1
                                                                                                                                                                                                                                                                                                                                                                                                   ICSUM = ICSUM + ICL+16+1CR
                                                                                                                                                                                                                                                                                                                                                                                LINE (L+18) = KHEX (ICR+1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NORMAL EXIT
                                                                                                                                                                                                                                                                                                                                                                 LINE (L+9) = KHEX (ICL+1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ERROR EXIT
                                                                                                                                                                                         ICSUM-ICSUM+KI+16+K2
                                                                                                                                                                                                                                                                                                             ICR=LBYTES (J) - ICL+16
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       LINE (42) = KHEX (KCL+1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      LINE (43) = KHEX (KCR+1)
                                                                                                                       INE (4) = KHEX (K1+1)
                                                                                                                                                                       .INE (7) =KHEX (K4+1)
                                                                                                                                         INE (5) = KHEX (K2+1)
                                                                                                                                                         INE (6) = KHEX (K3+1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               .INE (18) = KHEX (16)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              INE (11) = KHEX (16)
                                                                                                                                                                                                                                                                                               ICL = LBYTES (J) /16
                                    KR=KADR-K1 +4896
                                                                                                                                                                                                                                            LINE (8) = KHEX (1)
                                                                                                                                                                                                                                                              LINE (9) = KHEX (1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                      KR=1CSUM-256+K1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             LINE (J) = KHEX (1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              .INE (9) = KHEX (2)
                 K1=KADR/4896
                                                                    KR=KR-K2#256
                                                                                                                                                                                                                                                                               31,116
                                                                                                                                                                                                                                                                                                                                                                                                                                    K1=1CSUN/256
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      KCL=15-KR/15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             00 29 J=4,8
                                                                                                      (4=KR-K3#16
                                                   K2=KR/256
                                                                                    K3=KR/16
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         888 OLOS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CONTINUE
                                                                                                                                                                                                                           CONTINUE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 COTO 808
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CONTINUE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CONTINUE
                                                                                                                                                                                                                                                                                                                                                  L-247-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1=03=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       RETURN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         85566= 768
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     888 -86998
                                                                                                                                                                                                                                                                                                                                                                                                 84555= 18
84655=C++
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  86388= 758
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 $#3=23598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         82 -09/58
                                                                                                                                                                                                          83488=C+
                                                                                                                                                                                                                           6 =00583
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         85488=C++
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               86288=0++
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            =009938
                                                                                                                                                                      83205=
                                                                                                                                                                                                                                            83668=
                                                                                                                                                                                                                                                                            -00068
                                                                                                                                                                                                                                                                                                              -000018
                                                                                                                                                                                                                                                                                                                                              84260=
                                                                                                                                                                                                                                                                                                                                                                 84460=
                                                                                                                                                                                                                                                                                                                                                                                                                                   84788=
                                                                                                                                                                                                                                                                                                                                                                                                                                                    84898=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   =96618
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     85168=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       85268=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              =82828
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            =99658
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               -86393
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    =90198
                                                                                                                                      83356=
                                                                                                                                                                                         83300=
                                                                                                                                                                                                                                                                                                                                 84163=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      8528B=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         85366=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              86168=
                                                                    -83978
                                                                                      =86178
                                                                                                                       =02628
                                                                                                                                                         =001E8
                  COMMON/TRANS/LBYTES(16), IVAL, NVAL, LTYP, LADR(4), LIINE(43), IBYTE
                                                                                                                                                                                                                                                                              DATA-BYTE IS REPRESENTED AS A 2-CHARACTER HEX VALUE
                                                                                                                                                                                                                                            TRANSFORMS LBYTES INTO A PAPERTAPE HEX-DUMP FORMAT
                                                                                                                                                                                                                                                               COMMON TO MANY 8089 MICROPROCESSOR SYSTEMS. EACH
                                                                                                                                                                                         E-->80-->CR-->15(0CT), 6-->8A-->LF-->12(0CT)
                                                                     1 KHEX (6), KHEX (7), KHEX (8), KHEX (9), KHEX (18), KHEX (11),
                                                                                                                                                                                                                                                                                                                               NN-->A COUNT (IN HEX) OF DATA BYTES TO COME
AAAA-->ADDRESS OF FIRST BYTE (HEX)
                                                                                                                                                                                                                                                                                                                                                                                                 CC-->HEX CHECKSUM VALUE = FF-SUM (HH-VALUES)
                                                                                                                                                                                                                                                                                                                                                                IT--XLINE TYPE (88-DATA LINE, 81-EOR LINE)
                                                                                       KHEX (12), KHEX (13), KHEX (14), KHEX (15), KHEX (16)
                                                     DATA KHEX (1), KHEX (2), KHEX (3), KHEX (4), KHEX (5),
                                                                                                                                                                                                          SETUP START OF LINE (SOL)
                                                                                                      1H6, 1H1, 1H2, 1H3, 1H4, 1H5, 1H6, 1H7,
                                                                                                                       148,149,14A,14B,14C,14D,14E,14F/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SETUP PROCESS PER LITP
                                                                                                                                                                                                                                                                                                                                                                                  HH -- SHEX DATA BYTE VALUE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           IF (LADR(I) . NE. KHEX(J)) COTO 5
                                                                                                                                                                                                                                                                                               LINE FORMAT FOLLOWS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  FOLLOW ON ADDRESS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 IF (LTYP.Eg.3) GOTO 788
IF (LTYP.Eg.2) KADR-KADR+16
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        INITIAL PROCESS
                                                                                                                                                                          DATA JCRIN, JLINF/1HE, 1HB/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             KADR = (J-1) #16## (LL) +KADR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         IF (LTYP. CT. 1) GOTO 7
                                    DIMENSION KHEX (16)
                                                                                                                                                                                                                                                                                                                  :-->S.0.L.
    SUBROUTINE ILINE
                                                                                                                                          DATA KOLON/1H:/
                                                                                                                                                                                                                                                                                                                                                                                                                                                      LINE (2) = KHEX (2)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       LINE (3) = KHEX (1)
                                                                                                                                                       DATA IHB/IH /
                                                                                                                                                                                                                                                                                                                                                                                                                                    LINE (1) = KOLON
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       00 4 1=4,43
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       LINE (1) = IND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DO 5 J=1,16
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         111-1 9 00
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CONTINUE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CONTINUE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CONTINUE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           KADR-6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1-4-11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 9 0100
                                                                                                                                                                                                                            ###3=##681
                                                                                                                                                                                                                                             ###3=8686V
                                                                                                                                                                                                                                                               19189=544
                                                                                                                                                                                                                                                                               79268=C+++
                                                                                                                                                                                                                                                                                               79368=044
                                                                                                                                                                                                                                                                                                               79488=C+++
                                                                                                                                                                                                                                                                                                                               19566=C###
                                                                                                                                                                                                                                                                                                                                                                 19766=C+++
                                                                                                                                                                                                                                                                                                                                                                                  1113-5536/
                                                                                                                                                                                                                                                                                                                                                                                                 ###3-8366Z
                                                                                                                                                                                                                                                                                                                                                    ***3-8896/
                                                                                                                                                                                                                                                                                                                                                                                                                     86888=C+++
                                                                                                                                                                                                            F-3-99884
                                                                                                                                                                                            78788=C##
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  88288= 4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ##J=69988
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ##3=88888
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1988= 7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               11688= 5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 31766= 6
                                                                                                                       -8863/
                                                                                                                                       78483=
                                                                                                                                                                          78638=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -82468
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                                                                                                                                                                                                                                                                                                                                                                                                                                                       -86788
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        -86566
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            81660=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            81188=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1388=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              81468=
                                                                                       78188=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            -9666
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              31568=
```

SUBROUTINE MARK(IX,IT,IDX,IDY)
IIX=IX+IDI SUBROUTINE ERR(IOUTF,NM, IEDJ) JEKK, CT.KN) COTO 18
WRITE (100TF, 980)
FORMAT (2H ?)
RETURN
TEOJ=-TEOJ
RETURN
ETURN
ETURN 117=1Y-1DY CALL DRAMBS(IIK-IIY) CALL MOVAES(IX-IY) RETURN END IIY=IY+IDI CALL MOVAES(IIX+IIY) IIX=IX-IDX FUNCTION ENER(VEC.N) DIMENSION VEC(N) DO 18 J=1.N T=T+VEC(J)++2 ENCR=T RETURN END KK=KK+1 1876= 1888= 1988= 1918= 1928= 1928= 1958= 1958= 1958= 1958= 3838\*\*
3838\*\*
3858\*\*
3858\*\*
3858\*\*
3858\*\*
3898\*\*
3898\*\* SUBROUTINE FISORT(FIN, 1TAG, FOUTCH)
DIMENSION FIN(NN), 1TAG(NN), FOUTCHN)
SORT ROUTINE IF (FOUT (N) .CT.FOUT (K)) GOTO 15 SORT FOUT AND ITAG SUBROUTINE IASORT(IN.KN)
DIMENSION IN(NN)
DO 28 N=1.NN IF (IN(N) LT. IN(K) ) GOTO 15 IT=IN(N) SET UP ITAGS T=FOUT (N) FOUT (N) =FOUT (K) FOUT (K) =T TAC (N) = ITAC (K) DO 15 K-KN,NN FOUT (N) =FIN (N) DO 15 K=KN,NN IN (N) = IN (K)
IN (K) = IT
CONTINUE
CONTINUE
RETURN DO 16 N=1.NN NN 1 = N 82 00 TTAC (K)=17 IT=ITAG (N) CONTINUE CONTINUE RETURN END ITAG (N) =N 1+N=KX KN=K+1 96666= 96766= 9686= 97866= 97166= 97268= 97368= 9758= 9758= 9758= 9758= 9758= 94488= 94588= 94588= 94588= 94588= 95888= 95888= 95888= 95888= 95888= 95888= 95888= 96428=C++ 96588= 96388= 16 \*\*J=83894 32988=C++ 96288=

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19. KEY WORDS (Continue on reverse side if necessary and identify by block number)	
Microprocessor programs	
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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)	
A tool for developing microprocessor based patter	
A two segment system of programs is implemented.	One segment is a subsystem
consisting of a generalized pattern classifier pr	
for an INTEL SBC 80/20 microprocessor system. The subsystem of four interactive programs. These for	
selection, pattern class definition and performan	
procedures fitted to the classifier algorithm. T	

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user supplied file of feature vectors. It produces a class defining structure for use by the classifier. It can use a TEKTRONIX 4014 for graphics support and will operate interactively within the CDC 6600 Intercom partition. Structured design, modular code, buffer allocation algorithms, and ANSI standard FORTRAN code make this segment transportable. The classifier segment requires an 8080 system. Less than 256 bytes of ROM are used. Data buffer locations and sizes, the number of classes and the number of features are specified by the user. Experiments produced estimates of classifier performance for this system. An error rate of less than ten percent is reported for one 26 class character recognition experiment.

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